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Renal Infection in Pulmonary Tuberculosis.—The lesions which occur in the medulla do so almost entirely in association with lesions in the cortex. The probable explanation of the fact that some observers state the original focus to be in the medulla is that tubercles there appear to progress more rapidly. This may be due to lessened resistance of its tissues once infected. The connection between tubercles in the medulla and cortex lies probably in the connecting lymphatics between the superficial and deep plexus. This view of primary glomerular infection and intrarenal lymphatic spread from cortex to medulla is supported by the fact that tubercles in the cortex may exist alone, but in the medulla are always associated with lesions of the cortex, and that in rapidly progressive miliary tuberculosis the lesions are almost always confined to the cortex. Several observers have also described gross medullary lesions connected with small cortical tubercles by lines of tuberculous infiltration. *Excretion of tubercle bacilli in the urine:* Among several series of cases of pulmonary tuberculosis without urinary symptoms reported by different authors, about 10 per cent have been found to show tubercle bacilli in the urine. They are more commonly found in advanced cases, and very frequently in cases approaching a fatal termination (Flick). Hobbs and his collaborators obtained positive results in 6 of 100 cases in various stages, using catheterized morning specimens, centrifugating for examination and inoculating guinea pigs with a portion of the material. Of two of these patients who died, one was found to have a small caseating renal focus, the other on careful necropsy failed to reveal any evidence of renal or genitourinary tuberculosis. It therefore seems fair to argue that, just as tubercle bacilli may enter the body without leaving any lesion at the portal of entry, so they may be excreted without producing a lesion. It is probable that tubercle bacilli circulate in the blood only at certain periods or stages. Albuminuria may or may not be associated with renal infection. Blood cells are not found in more than half of the cases, and pus cells rarely in large numbers. *Microscopic tuberculous changes in the kidney:* Of 100 cases in which the urine was examined, 18 died, and full postmortem examinations were performed on these and 4 other cases dying of pulmonary tuberculosis. Macroscopic evidence of disease was found in 4 (18 per cent) of these 22 cases, microscopic in 32 per cent. In all cases the lesions were most abundant in the cortex, and in those cases showing only microscopic lesions were confined to the cortex. Collections of cellular proliferation showing caseation and giant cell formation were among the early pathological changes. Two cases showed small isolated fibrotic deposits thought possibly to be healed foci. Another and more common change was thickening of the connective tissue of Bowman's capsule and epithelial proliferation. The glomerular loops may be found intact in the midst of a tuberculous degeneration. *Conclusions:* 1. From the postmortem records of 1000 cases, tuberculous lesions of the kidneys associated with pulmonary tuberculosis were found in 16.2 per cent on macroscopic examination, of which a small number showed some clinical evidence of renal tuberculosis. Among 22 patients dying without such symptoms and subjected to microscopic examination, 32 per cent showed lesions. 2. Males predominated slightly and the commonest age period was 20 to 30. 3. Both kidneys were diseased in most cases, one usually more so, especially the right. 4. "Surgical" renal tuberculosis is rare in association with pulmonary tuberculosis. 5. Hematogenous infection is the ordinary

route and the earliest changes occur around the glomeruli. Later there is probably direct lymphatic extension to the medulla, associated with lines of round cell infiltration. The medullary lesions often progress more rapidly. 6. Tubercle bacilli were found in the urine of 6 per cent of phthisical patients. In one patient who died no evidence of renal tuberculosis was found. 7. A trace of albumin was found in about half the cases examined, but appeared to bear more relation to the pulmonary disease and the fever than to renal tuberculosis. 8. Casts were found in 23 per cent of cases, bearing no relation to renal tubercle. 9. Localized collections of round and epithelioid cells are probably the earliest pathological reaction. Bowman's capsule early becomes thickened, possibly accounting for the resistance to invasion, shown by the glomerulus.—*The Elimination of the Tubercle Bacillus by the Kidneys in Pulmonary Tuberculosis, F. B. Hobbs, Tubercle, December, 1923, v, 105.*

Genital Tuberculosis in Men.—The material examined covered the period 1904–1921 and were operated cases of testicular tuberculosis. Without reference to previous gonorrhoea or trauma the most frequent ages were 20 to 40 years. About 60 per cent of the patients had no other manifestations of tuberculosis. A previous gonorrhoea was found in only 15 per cent, so that this did not seem to predispose to the affection. In 25 per cent a history of trauma was obtained; in 50 patients with tuberculosis of the epididymis trauma occurred in 16 per cent, while it occurred in 50 per cent of 19 cases with testicular tuberculosis, which is considered remarkable. In 2 cases kidney colic preceded onset, which according to Rovsing indicates an affection of the seminal vesicles. Numbers of patients had pain in the loin and sacral regions. Treatment, when the epididymis alone is involved, consists of resection, with implantation of the central vas deferens end in the skin wound; this precaution is taken to avoid spread to the other side. The attempt to plant the vas deferens into the testicle is to be condemned. Forty-seven cases of resected epididymal tuberculosis were reëxamined later, and in no case was there a residual development in the testicle; only in one case it occurred in the opposite testicle. In 4 cases tuberculosis of the urinary tract developed a number of years after the operation. A comparison of the results of epididymectomy with castration (in the presence of healthy testicles) favors the former; castration is only to be used when the testicles are diseased. Sexual life was not changed except in one case. In a number of cases of epididymectomy after previous castration on the other side, there occurred diminished potentia and libido. Epididymis resection is to be performed as soon as possible after development of the disease, since the danger of spread to the other side can only thus be diminished.—*Die Genitaltuberkulose bei Männern und die Resultate ihrer Behandlung, insbesondere die Resultate der Epididymektomie, F. Rydgaard, Arch. f. klin. Chir., 1923, cxxiii, 758.*

Tuberculosis of Epididymis from Tuberculosis of Skin.—Report of a case in which it is believed possible that there was a relationship between the skin tuberculosis and epididymis tuberculosis.—*Hauttuberkulose als Eingangspforte für Tuberkelbacillen und ihr Zusammenhang mit Nebenhodentuberkulose, Facharztliches Gutachten, Hochstetter, Ztschr. f. Tuberk., January, 1923, xxxvii, 362.*

Genesis of Ovarian Tuberculosis.—Tuberculosis of the ovary is more common than is usually realized. There are three ways in which infection can occur: by direct contact from neighboring structures (mainly the peritoneum and tubes), by lymphogenous extension from the tubes via the broad ligament and, finally, by the hematogenous route. The ovaries were examined in 20 cases of tuberculosis with hematogenous dissemination in other organs definitely established. Of these 7 were adults, 8 children from 1 to 12.5 years of age and 5 sucklings. In 19 cases there was a primary pulmonary tuberculosis and in 1 anatomically definite primary intestinal tuberculosis. In 13 the ovaries were entirely free from tuberculosis or any suspicious findings, while in 7 cases tuberculosis was found microscopically in the ovaries: 4 times in adults and 3 times in children. In 5 of the 7 cases both ovaries were affected, while in 2 (1 child and 1 adult) only one ovary revealed changes. Even in the presence of a heavy seeding in other organs in acute general miliary tuberculosis a seeding of the ovaries need not always occur, while a slight generalization need not necessarily exclude ovarian involvement. Genetically, in 4 cases the ovarian tuberculosis was a part of the generalized tuberculosis while in 3 cases it was preceded by a perioöphoritis. The frequency of ovarian tuberculosis in hematogenous dissemination is less than that in other organs (brain, spleen and kidneys). All cases of neighboring tuberculous peritonitis do not lead to a tuberculous perioöphoritis or oöphoritis. The cortex of the ovaries was most frequently the seat of hematogenous tubercles, the medulla second

and the tunica albuginea revealed tubercle once. The lymphogenous origin of ovarian tuberculosis requires further study.—*Zur Genese der menschlichen Eierstocktuberkulose, E. Wertheimer, Arch. f. Gyn., March, 1923, cxviii, 136.*

Miliary Tuberculosis.—A patient entered the clinic with a peculiar feeling in the head, inability to see clearly and everything appearing dark. The skin was dry, markedly cyanotic and pale, and the urine scanty. Negative serological and bacteriological studies ruled out typhoid fever; the cyanosis combined with pallor suggested miliary tuberculosis but the roentgen plate was negative. Autopsy showed generalized miliary tuberculosis with numerous small early foci of tuberculosis in pleura and lungs. One must assume that (1) not all miliary nodules on the pleura will show in the plate, (2) slight lung involvement in miliary tuberculosis need not give roentgen plate findings, and (3) cyanosis in miliary tuberculosis does not depend on anatomic changes in the lungs. —*Zur Kasuistik der Miliartuberkulose, F. Jarisch and H. Hönlinger, Wien. klin. Wchnschr., December 6, 1923, xxxvi, 870.*

Tuberculous Meningitis after Epidemic Meningitis.—The injury done the central nervous system by cerebrospinal meningitis may possibly be a predisposing factor for the subsequent development of tuberculous meningitis if the tuberculous infection was present beforehand. Such a condition is shown in the case of a child seventeen months old who developed typical symptoms of cerebrospinal meningitis with meningococci in the spinal fluid. The child made an uneventful recovery, was well for about three months and again developed signs of meningitis but with a clear spinal fluid. His condition grew worse and was diagnosed tuberculous meningitis. At the end of a month he died, and autopsy showed fresh tuberculous meningitis, marked internal hydrocephalus, tuberculosis of the lungs and a few tuberculous nodules in the liver, spleen, and kidneys.—*Zur Frage des Zusammenhanges von Meningitis tuberculosa und Meningitis cerebrospinalis epidemica, E. Stransky, Wien. klin. Wchnschr., January 10, 1924, xxxvii, 36.*

Papulonecrotic Tuberculides Simulating Syphiloderm.—Grouping of lesions in papulonecrotic tuberculides sufficient to cause a marked resemblance to tertiary serpiginous lues has been rarely observed. Jadassohn has observed in adults a variety of tuberculide characterized by the tendency to grouping but with the absence of necrosis. The case reported here was characterized by the presence of well developed necrotic lesions as well as grouping. X-ray films showed an old healed pulmonary tuberculosis. Under antisyphilitic treatment some of the lesions retrogressed temporarily, but reappeared in the midst of further antiluetic treatment. The histological picture and the laboratory tests corroborated the diagnosis of tuberculide. There are cases of papulonecrotic tuberculide which so closely resemble syphilis that a clinical diagnosis is made with the utmost difficulty.—*Tuberculosis Papulonecrotica with Serpiginous Lesions Resembling Tertiary Serpiginous Syphiloderm, M. Schier, Med. Jour. & Rec., January 16, 1924, cxix, 95.*

Type of Tubercle Bacillus in Lupus.—Up to 1922 there were reported in the literature 93 cases of lupus which were examined for tubercle bacilli, and of these 81.72 per cent proved human and 18.28 per cent bovine. The English Tuberculosis Commission in 1907 reported 20 cases, of which 55 per cent were found due to the human and 45 per cent to the bovine bacillus. The positive findings in this study with pieces of lupus skin were 47.83 per cent due to the human and 52.17 per cent to the bovine bacillus. It is pointed out that it is difficult to isolate the bacilli from lupus tissues and that many cases were previously reported negative which, with exacting technique, should have given positive results.—*Experimentelles zur Prüfung der Frage, inwieweit der Lupus auf humaner oder boviner Infektion beruht, M. Kirchner, Ztschr. f. Hyg., 1922, xcviii, 447.*

Treatment of Tuberculosis.—The successes of tuberculosis treatment are to be attributed primarily to the general and not to the specific treatment. Whether, however, climate plays the potent part in high altitudes is discussed. A number of questions on heliotherapy are considered and preference is given to the high altitudes in all cases.—*Bemerkungen zur Tuberkulosebehandlung, E. Peters, Beitr. z. Klin. d. Tuberk., March, 1923, liv, 431.*

General Treatment of Tuberculosis.—The general hygienic treatment is associated with the hygiene of growth, nutrition and housing. The main stress during growth is to be laid upon preventive sun cures in combination with air baths. Alternate rest and exercise is of importance. Air bath and gymnastics combined are essential to the preventive treatment of childhood tuberculosis. In the cities every grass plot should be utilized. The use of water is necessary

for the general bodily health. The actively tuberculous always belong in sanatoria. Not only the present but also future generations will suffer from the undernourishment of the war. The poor and middle classes should be given the opportunity of purchasing cheap foods. Even under existing circumstances tuberculous individuals should have individual rooms or at least a separate bed.—*Die allgemein-hygienische Behandlung der Tuberkulose, K. Klare, Ztschr. f. Tuberk., September, 1922, xxxvi, 510.*

Frenzied Therapeutics in Tuberculosis.—In our endeavor to find some therapeutic agent that will cure tuberculosis or tend to eliminate some of its disagreeable symptoms, we have built up an armamentarium that bids fair to bury the patient under an avalanche of drugs and serums. Von Ruck's vaccine, Denys's filtrate, tuberculin and Friedmann's vaccine have had their day only to be dropped in time. Calcium and iron have been boomed; so also have copper and the vital dyes; but the only agents that have stood the test of time are rest, graduated exercise, good food, fresh air, the oft discussed but never settled question of climate, and last, but not least, proper supervision. Next to these in value is artificial pneumothorax. Next in order of usefulness is heliotherapy, if its use is restricted to so called surgical tuberculosis, but there is no convincing evidence that it has the least value in the pulmonary form. Thoracoplasty is indicated when artificial pneumothorax cannot be done, the opposite lung is free from activity and the patient's general condition fairly good. Many methods of immobilizing the affected side have been advocated after an unsuccessful attempt at artificial pneumothorax, but that which offers the best chance for real effectiveness is a so called pneumatic lung splint. This consists of a jacket made to measure, into one side of which is inserted a pneumatic bag which is inflated by a valve and stem leading to the outside. One can exert any pressure that the patient will permit and it will immobilize the chest. The utter uselessness of the vast storehouse of drugs and serums that are given to the unsuspecting patient with the hope of curing a chronic disease is commented on. At best we expect in the majority of cases only to arrest the pathological changes and restore a physical condition somewhere nearly to par, with the added assurance of reasonable health for years to come. To offer more than this with our present knowledge of tuberculosis is to create false hopes that sooner or later must be sadly broken.—*Frenzied Therapeutics in Tuberculosis, L. S. Peters, Med. Jour. & Rec., February 6, 1924, cxiv, p. iv.*

Mobilization of Entire Shoulder Girdle as Aid to Thoracoplasty for Pulmonary Tuberculosis.—In order to make the first rib accessible and to enable resection, a Z-shaped incision is made from the sternal end of the clavicle to close to the insertion of the pectoralis major in the forearm, from here along the outer lower border of the same muscle almost to the rib angle and from here bending to the twelfth rib. The pectoralis major and minor are separated close to their insertions into the humerus and on the coronoid process. The various attachments of the serratus anterior are separated from the ribs and the latissimus dorsi is cut through in the vicinity of the lower skin incision. If the loosened or cut muscles are now separated to the front (pectoralis major and minor) or to the back (serratus anterior and latissimus dorsi) and the shoulder girdle is pulled toward the arm, then the ribs of the entire thorax side are laid bare for resection and only the subclavian muscle needs to be separated from the first rib to mobilize the clavicle and shoulder girdle satisfactorily and resect the first rib. The large vessels and nerves are easily protected. After resection the continuity of the severed muscles is carefully restored. The procedure was tested on cadavers and in life and gives easy access to the first rib, is relatively bloodless and can be rapidly performed.—*Die Mobilisierung des ganzen Schultergürtels als Hilfsmittel bei der Thorakoplastik wegen Lungentuberkulose, K. Ostermeyer, Zentralbl. f. Chir., October, 1922, xlix, 1504.*

Progress of Sanatoria.—Twenty-five years ago the number of sanatorium beds in the country was 1100 while the number of consumptives was about a million. At present the number of beds is 60,157. The example of Rutland Sanatorium is in no small part responsible for this progress.—*The Significance of Rutland to the Nation, H. L. Barnes, Boston M. & S. J., November 29, 1923, clxxxix, 862.*

Sanatorium Statistics.—The work is a statistical study of sanatorium treatment of pulmonary tuberculosis. The same cases are reported that were covered in 1911 for the period 1895 to 1904. There were studied 2,864 phthisis cases under sanatorium treatment, 1,878 men and 986 women: 761 (618 men and 143 women) were rejected, and of the remainder 1,866 (1,095 men and 771 women) were treated longer than 4 weeks; 24 per cent were treated once, 7 per cent twice, and in individual cases repeated return treatments were necessary. Of these cases there were, after 17 years, 46.9 per cent economically independ-

ent; 35.2 per cent had died and 8.2 per cent were invalids. Those able to work were 48 per cent of the men and 69 per cent of the women. Those able to support themselves were 27 per cent men and 42 per cent women, about one-third of all. Of the 1,263 sanatorium patients during the period 1895 to 1900 (761 men and 502 women), by the end of 1901, 13.1 per cent had died and 62.1 per cent were fully able to work. At the end of 1904, dead 19.8 per cent, fully capable of work 59.7 per cent; at the end of 1910, dead 24.2 per cent, fully able to work 58.4 per cent; at the end of 1921, dead 37.7 per cent, fully able to work 45.3 per cent. The results of sanatorium treatment are, therefore, highly satisfactory, and contradict the pessimism of Cornet. The period of ill health among the cases, measured by subjective symptoms, before sanatorium treatment was 1 to 6 months for 504, 6 to 24 months for 577, 2 to 6 years for 412, 6 to 12 years for 165, over 12 years for 68; averaging 28 months. Many of the cases died of accidents, dysentery, typhoid fever, carcinoma, and female diseases. Regarding the definite diagnosis of tuberculosis, this was well controlled, and many of the questionable cases were excluded from this study. It is not to be denied that many of the sanatorium cases would have done well without the sanatorium treatment with proper care at home. It was noted that the early cases did not do much better than the moderate cases, in so far as end results were concerned (64 per cent as against 55 per cent).—*Für die Heilstätten, F. Reiche, Beitr. z. Klin. d. Tuberk., February, 1923, liv, 210.*

Review of German Sanatoria for 1921.—The reports from 34 sanatoria vary decidedly, since some accept patients directly from private physicians and others only through their own examiners. The percentage of open tuberculosis varies from 15 to 66 per cent for males and from 15 to 52 per cent for females. There is a similar variation of classification (Turban—Gerhardt). While one sanatorium had over 77 per cent of Stage I and 3 per cent of Stage III cases, another had only 1 per cent of Stage I and 84 per cent of Stage III cases. The classification of suspected cases is extremely variable. In one sanatorium they were 47 per cent and in another zero: here the method of admission as well as the classification may account for the differences. Again, in tuberculosis of children, 30 per cent had pulmonary tuberculosis and one-third of these were given as Stage I, in spite of the fact that Stage I is a rarity (according to Ranke). Caution is necessary in making a diagnosis of bronchial lymph node tuberculosis. A rating of clinical results is valueless with such unsatisfactory material. Pneumothorax treatment was used by only 12 of the 34 sanatoria. Tuberculins were used in 10 per cent of the sanatoria, but any interpretation of its value must be accepted with caution. Sunlight was used in only 2.5 per cent and the quartz lamp in 20 per cent of the institutions. Laryngeal tuberculosis occurred as a complication in only 5.3 per cent of all patients.—*Jahresbericht deutscher Lungenheilanstalten 1921, H. Ulrici, Beitr. z. Klin. d. Tuberk., December, 1922, liii, 459.*

Rutland Sanatorium.—Rutland Sanatorium founded in 1891 was the first of its kind in New England. Its history is that of the pioneer—at first, a fight against great odds; then with victory came recognition from the general public. Despite the protests of the medical staff, exaggerated reports of "cures" got into the lay press. The inevitable depression and pessimism followed, which fortunately has been replaced by a rational and sensible attitude on the part of the public toward sanatorium treatment.—*The Early History of the Rutland Sanatorium, V. Y. Bowditch, Boston M. & S. J., November 29, 1923, clxxxix,* 853.

Vejlefjord Sanatorium.—The sanatorium is on slightly rising ground quite close to the water's edge. It was under the guidance of the late Professor Saugman. The thoracoscope and thoracoplasty operation are features. The light room is equipped with its two very powerful carbon arc lamps (75 amperes each). The initial exposure is fifteen minutes in debilitated patients and thirty minutes in the more robust. This is gradually increased until the maximum of two and one-half hours is reached. The results are excellent, particularly in cases complicated with laryngitis or lupus, a marked feature being the relief of pain in laryngeal cases.—*A Visit to a Danish Sanatorium, J. Johnstone, Brit. J. Tuberc., October, 1923, xvii, 179.*

Municipal Tuberculosis Dispensaries.—As a result of a general inquiry among the larger Bavarian dispensaries their maintenance and management are discussed. The supporters of dispensaries in a city are either the community or a society. In each city there should be one dispensary that must have at least three rooms. A roentgenological equipment is absolutely essential. In small cities the dispensary nurses can also assume other duties, but in the larger cities their work must be confined

to the tuberculosis dispensary. The work of the dispensary should be therapeutic-diagnostic as well as hygienic. For general advice the dispensary should be at everybody's disposal. Coöperation with school physicians is necessary. Every dispensary must do social service work, carried on by dispensary nurses under the order of dispensary physicians. The aim should be to separate all tuberculosis cases if possible from their families, and especially from the children. The larger dispensaries have the duty to train physicians and nurses, to educate the public and to apply their own observations practically.—*Einrichtung und Betrieb der Fürsorgestellen für Lungenkranke unter städtischen Verhältnissen, G. Seiffert, Beitr. z. Klin. d. Tuberk., February, 1923, liv, 264.*

Treatment of Tuberculosis outside of Sanatoria.—Not all infected individuals require medical treatment. Those in danger of developing symptoms require observation as well as those who are ill. All measures increasing the resistance of the body must be utilized. Among these specific and sunlight treatment are important. Since the hospital and sanatorium beds do not suffice all outside measures should be used to bring about healing and to prevent recurrence.—*Die Behandlung der Tuberkulösen ausserhalb von Heilstätte und Krankenhaus, His, Ztschr. f. Tuberk., September, 1922, xxxvi, 489.*

Employment for Tuberculous.—Fitting the tuberculous person back into industry is a difficult task, because (1) sanatorium graduates are returned prematurely and do not have sufficient physical stamina for work, (2) one-half of them are permanently disabled and require "sheltered" work, (3) most of them are unskilled, (4) they need the income and working conditions which surround those doing skilled work, (5) their consciousness of the need of rest causes them to be thought of as slack and unreliable, (6) many people (fellow workmen) fear them, and (7) they return without any "vocational training." In New York City there are more than 20,000 wage-earners sick with tuberculosis and of these probably one-half are dependent. Certain requisites for placing the tuberculous in employment are (1) pre-industrial training courses which give instruction as to the relation of work to health, necessity of continued medical oversight, etc., (2) competent medical supervision after sanatorium treatment and entrance to work, (3) sheltered work, (4) vocational training to patients who cannot return to their former occupations, and (5) employment in regular industries for those physically fit to carry on the work. The New York Tuberculosis Association has organized a vocational and placement service which is studying industries as they apply to the tuberculous person, giving advice to ex-patients and finding employment or supplying vocational training to those that require it, and following persons placed or under observation by careful medical supervision.—*Employment for the Tuberculous, J. B. Deacon, New York Tuberc. Ass. Bull., November–December, 1923, iv, no. 5, 1.*

Village Settlements for Consumptives.—The folly of certain institutions or training colonies attempting to train tuberculous ex-soldiers or pensioners to fit themselves for certain trades or for agricultural pursuits is pointed out. In the latter instance, what man will get work on a farm if he has to pick or choose his job? What wage is he likely to get for part-time work when the full agricultural wage is 25 shillings a week? The truth is that the light job in the open air is a myth, and its advocates are false prophets. In any trade a consumptive trained for a short time cannot compete with the healthy, fully trained worker. In any occupation in which labor has to conform to the economic law, he will find himself utterly outclassed. It is admitted that during training a temporary benefit certainly accrues from living under proper conditions and by being given some technical instruction to occupy his time. But can a man with a disability of hardly ever less than 50 per cent and at the age of thirty or over learn a new technical trade so well as to compete with the 100 per cent man who by long apprenticeship has a full and complete knowledge of that trade? The answer is emphatically no. The working class consumptive cannot compete in the open labor market, even at his own trade, much less in the trade of which he has but a superficial knowledge. The advantages of such an industry as the Papworth Colony is emphasized. Here the tuberculous worker remains and earns his living under settlement conditions at a village settlement. The adverse factors which are responsible for the breakdown of the tuberculous worker in the commercial world are eliminated under settlement conditions. The stress and strain, the economic pressure, is reduced to a degree that he can bear; he is protected from the burden of competition. At Papworth it was found that a consumptive is unable to earn enough for large overhead charges and for a dividend for his employer. For these reasons a consumptive cannot be

employed in a money making concern. But under suitable conditions, as at Papworth, the consumptive can and does earn his own living and earns it fairly well. Is this not then the plan for further progress in the tuberculosis campaign? Mention is also made of the type of consumptive who has no liking for industry. He has no desire to "get well," lest, his working capacity being restored, his pension should be lost. Such cases are a serious problem.—*Village Settlements for the Consumptive, Some Economic Considerations for "Training," P. C. Varrier-Jones and C. Allbutt, Lancet, October 20, 1923, ccv, 912.*

Domiciliary Treatment of Osseo-Articular Tuberculosis.—Following two months' work at Alton in the summer of 1919, Rivers tried conservation treatment in 22 cases in dispensary practice, more than two-thirds of which were treated at home throughout. He published the results in December, 1921, showing that nearly an eighth had recovered and discarded apparatus, while in over 60 per cent the disease had become quiescent; all the cases remaining active were in adults. Since then there have been 16 new cases, bringing the total to 38, of which over 80 per cent were treated at home, as the general practitioner became weaned from the bad old plan of ambulant general hospital treatment. Of these, 9 have discarded apparatus and returned to school or work, and 12 are up and about in splints. The homes were ordinary working class dwellings. Diagnosis was confirmed by X-rays. The plan is to put the patient in bed next to an open window. A trestle board has been designed which will serve for hip, spine or knee affections; the height is such that the child can look out of the window without raising himself, and the foot-end is elevated, so as to take the weight of the bed clothes off the feet. A flatiron is used as a weight, and two bricks to raise the foot-end. Practice soon makes easy the subsequent construction of celluloid splints. This domiciliary treatment is always worth trying preparatory to admission to an institution, and the latter will often be found unnecessary. With increasing success the number of new patients or examinees increases, since the general practitioner judges a tuberculosis scheme by nothing so much as the tuberculosis officer's clinical competence. Finally, there is the economic consideration, as it is far cheaper to treat patients at home than to send them away.—*Domiciliary Treatment of Osseo-Articular Tubercle, W. C. Rivers, Tubercle, September, 1923, iv, 546.*

Swiss Health Stations.—The chief requisites in the choice of a high mountain climate for the tuberculous in Switzerland are accessibility, medical equipment and supervision, and climatic conditions. These conditions are fulfilled in the high mountain stations and yet give considerable choice. For English speaking people it is the wisest course to reside in one of the excellent up-to-date sanatoria specially staffed by English or English speaking doctors. Surgical cases are advised to seek admission to one of the 32 clinics under Rollier's direct supervision. If of cosmopolitan tastes, one may go into one of the definitely Swiss sanatoria. The so called hotels are really sanatoria. One may take a flat or villa or pension. There are many philanthropic institutions. The expense of treatment for pulmonary cases in Switzerland need not be more than in Britain.—*Swiss Health Stations for Consumptive Cases and Other Tuberculous Subjects, T. N. Kelynack, Brit. J. Tuberc., October, 1923, xvii, 155.*

Alpine Climate for Tuberculous.—The advantages arise mainly from the action of the cold, dry and calm air, and bright sunshine. In Montana, Switzerland, the winter sunshine averages five hours daily. The ultraviolet rays are very strong; sky and snow shine greatly add to the total light effects. The dryness and coldness of the air stimulate body heat production. The basal metabolism rises from 40 to 100 per cent in patients living under open air conditions. The increased evaporation from the respiratory membrane produced by breathing dry cold air enhances the outflow of lymph and the secretion from the membrane. The beautiful surroundings have a beneficial effect on the patient. The combination of warm sun and cold calm air allows the patients to expose themselves happily and with bodily comfort to the open air.—*Psycho-Physiological Aspects of the Montana Climate ir Winter, L. Hill, Brit. J. Tuberc., October, 1923, xvii, 155.*

Altitude in Treatment of Tuberculosis.—Flügge maintained that all forms of tuberculosis are best treated at high altitudes. This reasoning would leave no hope for people who could not afford to take the cure at high altitudes but had to remain at home.—*Die Bedeutung der Kurorte des deutschen Mittelgebirges für die Heilung der Tuberkulose, A. Bacmeister and F. Baur, Ztschr. f. Tuberk., December, 1922, xxxvii, 161.*

Montana, Switzerland, as Tuberculosis Centre.—The pure, dry air, the pro-

duction of increased metabolism, the absence of dust and wind, and the extremely radioactive power of the sun are all important points in favor of Montana, Switzerland, as a centre for the care of the tuberculous. To get the best results patients should go in early stages of the disease. It is a mistake to let patients who are debilitated, emaciated or in the third stage of tuberculous disease of the lungs go to a high Alpine station.—*Montana: Climatic and Therapeutic Considerations, B. Hudson, Brit. J. Tuberc., October, 1923, xvii, 176.*

Heliotherapy.—The treatment of extrapulmonary tuberculosis has only recently begun to emerge from the mists of empiricism into the clear light of scientific knowledge. The use of indiscriminate surgical procedure shows a failure on the part of the surgeon to recognize the fact, now almost universally acknowledged, that a tuberculous involvement of any organ or structure of the body is only a local manifestation of a constitutional disease, the primary lesion of which is usually found in the lungs or lymph nodes. In Perrysburg, the Rollier method of heliotherapy has been employed with such variations as have been considered advisable owing to peculiar local conditions. The middle of the day, with its intense light and high temperature is contraindicated in the summer, but in the spring and fall this time of the day is to be desired, as these hours more closely resemble the comfortable early and late hours of the summer. Upon admission the patient is gradually accustomed to the out-of-door life before exposure to the sun is started. A robust patient, accustomed to exposure, may be started at once in the warm weather, while a hectic, emaciated, bedridden one must be handled more cautiously. Patients with fever or nephritis must be watched most closely. In general, the sun baths should be discontinued for one hour before and two hours after the midday meal. Special care must be taken that no breeze strikes the body, as chilling may cause irreparable harm. This danger may be avoided by the use of windbreaks or a special bed. This is most important and cannot be too strongly emphasized. After each insolation the patient may be given a spongebath and be rubbed with spirits of camphor and, if the skin is very sensitive, some vegetable oil, such as cocoanut or olive oil, may be applied. The following is a modification of Rollier's method: First day: The patient, reclining on a bed and with eyes protected from the sun by means of colored glasses or towel and the head by a linen cap or bonnet, is taken to the sun porch. Trunks only are worn, and blankets or sheets depending on the season. Only the feet are exposed and radiated on this day. They are insolated for periods of five minutes, three times during the day, with intervals of about one hour. Second day: The period for the feet is increased to ten minutes and the knees to ankles are insolated for five minutes. Third day: The time of exposure for those parts is increased by five minutes, and the lower extremities from knee to hips insolated for five minutes. On the fourth and fifth days the exposure for each part is increased by five minutes, and the abdomen on the fourth, and chest on the fifth day, are exposed for five minutes and daily increased by the same period. On the twelfth day the longest exposed part receives a total radiation time of three hours, the exposure-periods being for the feet, sixty minutes; knees to ankle, fifty-five minutes; thighs, fifty minutes; abdomen, forty-five minutes and chest, forty minutes. From this date to the sixteenth day the insolation period of the feet remains sixty minutes. The remaining divisions are increased by five minutes each day until each subdivision receives sixty minutes at a radiation period. On the seventeenth day the insolations are reduced to one morning and one afternoon period of ninety minutes each. If necessary, the period may be shortened or gradually increased to four hours per day. The total daily exposure should, if possible, be divided equally between the anterior and posterior aspects of the body. When the patient cannot be turned, the anterior surface above is insolated and the time awaited when the physical condition will permit the turning of the body. In the spring and fall, in robust patients, the five-minute periods may be increased to ten minutes. During insolation sinuses and ulcers are covered only by a wire screen. In the evening they are cleaned with alcohol and a dry dressing is applied. If interrupted the insolation should be resumed at a stage earlier than that at which it was stopped. A simpler method may be used in which the whole body is exposed from the first day. With the same eye and head protections as above, the body is exposed on the first day for three morning and afternoon periods of two minutes each at hour intervals. Each of the six exposure-periods is increased two minutes daily for fifteen days, when the total daily radiation will have reached three hours. The number of exposures may then be reduced to two in the morning and two in the afternoon with hourly intervals. On days when sun cure is not feasible an air bath is given by exposing the naked body. In the course of heliotherapy, the skin

gradually takes on a bronze hue, then a copper color and finally a chocolate brown. As pigmentation progresses the skin becomes supple and velvety, and free from blemishes. Leucocytosis, if present, becomes reduced, and actual lymphocytosis takes place. The progress of patients is in direct proportion to the intensity of pigmentation. Balderrey and Barkus have shown that solar radiation increases the alkalinity of the blood. They have also shown that when the body is exposed to direct sunlight, enough light passes through the body to affect a photographic plate when the body is placed between the plate and the sun. Of the 720 patients with extrapulmonary tuberculosis discharged between 1913 and 1923, 78 per cent of the adults and 18 per cent of the children showed a clinical pulmonary lesion. The results in these cases warrant the use of heliotherapy in pulmonary tuberculosis. Fifty patients chosen from advanced and moderately advanced cases, that were doing poorly under the ordinary sanatorium regimen, were put on sun cure; all showed most satisfactory constitutional and symptomatic improvement. A temperature of 100° to 101°, hemoptysis, chronic pleurisy and pyopneumothorax are not contraindications. *Conclusions:* 1. Extrapulmonary tuberculosis is only a local manifestation of a constitutional disease, being usually secondary to lung or lymph node tuberculosis and, therefore, the disease as a whole must be treated and not merely its local manifestations or complications. 2. Being a disease in which resistance is lowered through lack of air and sunshine, excesses, mental and physical strain, and insufficient rest, it should be treated in the country air in environments conducive to good health, cheerfulness and contentment. 3. While fresh air and sunshine are most important curative factors in the treatment of tuberculosis, rickets and other diseases due to the same predisposing conditions, they are of still greater value in preventing these diseases. 4. The sun is an analgesic and dispeller of gloom. 5. The sun is a great muscle developer as seen in the perfect musculature of those cases that have been in bed for years, and hence is a very important factor in maintaining good positions and in preventing the development of deformity when the patient is up and about and convalescing. The long continued use of casts for immobilization leads to the abolition of function through atrophic degeneration of specialized structures. 6. The results of operations in extrapulmonary tuberculosis have not been sufficiently encouraging to countenance the general application of surgery, whereas the results of sun treatment, both in this country and Europe, more than justify the use. 7. The sun is constructive, while operative procedures are destructive, in that, by attempting to destroy the focus of disease, the granulation tissue, which serves as a protecting wall to the surrounding normal structures, is likewise broken down, opening new areas of infection and increasing the possibility of the disease spreading and developing into acute generalized tuberculosis. 8. Surgical measures destroy and never assist in the restoration of function in a joint, while in heliotherapy our aim is to restore or maintain this function. 9. Surgical interference is justified only in those cases in which, in spite of heliotherapy and the resulting good physical condition, the local lesion has not shown any satisfactory improvement. It is justified to correct deformities developed during the course of treatment in spite of all the efforts to prevent them, to provide stability by an arthrodesis in a flail and useless articulation and to evacuate abscesses, and this only by aspiration or a small incision when the pus is very thick. It is justified in renal tuberculosis of the advanced state, when it is better to remove the kidney. 10. Artificial light in the treatment of extrapulmonary tuberculosis at its best is only a poor substitute and of questionable value.—*The Scientific Treatment of Tuberculosis, H. Lo Grasso, Boston M. & S. J., February 7, 1924, cxc, 187.*

Influence of X-Rays on Experimental Tuberculosis in Guinea Pigs.—X-rays cause a marked leucopenia in guinea-pigs and this can be utilized for shortening the inoculation test for tuberculosis. Thus tubercle bacilli were found in 10 days; once in the spleen, once in the spleen and kidney, and once in the hemorrhagic exudate in a peritonitis. There are two reasons why this method does not always succeed: (1) there may be deviations, and (2) infection and raying may be so massive that the animals die early and before bacilli can be determined. Whether the method is clinically adaptable remains to be proved.—*Beitrag zur experimentellen Meerschweinchentuberkulose und ihrer Beeinflussung durch Röntgenbestrahlung, H. Deist, Beitr. z. Klin. d. Tuberk., December, 1922, liii, 472.*

Permanent Results of Artificial Pneumothorax Treatment.—Of 172 cases of pulmonary tuberculosis in which artificial pneumothorax was continued for two years or longer, 15 were cured, 62 able to work and 85 living: in all, 49 per cent showed improvement and 51 per cent showed no

improvement. The study was made ten years after the first case was started. The immediate results were disappearance of bacilli in sputum in a considerable percentage and of fever in a very large percentage of the cases.—*Zur Frage der Dauerfolge nach künstlichem Pneumothorax, H. Maendl, Wien klin. Wchnschr., October 25, 1923, xxxvi, 756.*

Differential Double Manometers in Artificial Pneumothorax.—The use of a differential double manometer ensures greater safety than the single manometer. The apparatus here described has a differential regulator to control the rate of flow, which works in conjunction with an outlet tap. When the tap is open there is a wider respiratory oscillation than with a single manometer. The pressure head is also closely indicated by the distal manometer, whereas the single manometer apparatus does not even approximately indicate this. The cylinders are also more finely graduated than in the ordinary apparatus. The intrapleural pressure is read by closing the outlet tap and noting the eventual level reached by the fluid in the two manometers. Resistance being constant, fluid flows only as long as there is a difference of pressure in the two manometers, and the greater the difference the greater the velocity of flow. When the two manometers remain at equal levels some obstruction is to be suspected, or else a lack of sufficient pressure head. The taps used are specially constructed to avoid leakage. The observations made fail to support the claim that with certain mathematical formulae, based on pressure and resistance, intrapleural pressures can be accurately estimated, as there are many variable factors, including nervous reflexes and type of breathing. The pressure heads registered are probably not entirely accurate, since a part must be used to set the liquid in motion. —*The Induction of Artificial Pneumothorax with the Use of Differential Double Manometers, H. de C. Woodcock and Z. P. Fernandez, Tubercle, September, 1923, iv, 542.*

Artificial Pneumothorax Apparatus.—Description and illustration of new pneumothorax apparatus and portable water manometer.—*Neuer Pneumothoraxapparat und neues Wassermanometer, Zobel, Deutsche med. Wchnschr., November 30, 1923, xlix, 1470.*

Selective Collapse in Pulmonary Tuberculosis.—The principle of selective collapse is manifested in a series of phemonena that may be described thus: (1) If the lesion is not too severe, inflammation or irritation of the tissue in any region of the lung causes a tendency of the involved tissue to collapse and (2) a similar tendency to collapse is present in any anatomic division of a lung, the bronchus supplying which is inflamed or irritated. Contractility is slightly, if at all, diminished, while expansibility is markedly impaired. This tendency to contract is compensated by an increased tension of the adjacent healthy lung because the lung is obliged to conform to the shape of the thoracic cavity. If into a pleural cavity free from adhesions a small quantity of gas is introduced, not only is the total volume of the lung, and consequently the tension, reduced, but the lung is now also free to assume any form whatever, so the principle of selective collapse is unhindered. The pleura over the involved parts of the lung becomes retracted and the gas collects over these regions. This localization of the gas is a result of the action of the principle of selective collapse. The collapse itself takes place in the lung tissue, and appears to select, first, the inflamed tissue in and around the lesions, and, secondly, lung tissue in the regions supplied by involved bronchi. In scattered, deep seated lesions, the lung may not be collapsed immediately beneath the retracted pleura, but only around each lesion, leaving expanded parts between the lesions. This selection of diseased areas explains how a relatively small amount of air may cause effective collapse of lesions scattered through an entire lobe. Selective collapse forms slowly and is easily dissipated. Any exertion that causes rapid or deep breathing should be avoided. Better and more permanent healing takes place if the patient is kept at absolute rest for at least six weeks. Frequent severe examinations, and all examinations by prolonged or hard coughing, prolonged or heavy percussion, and especially those requiring the patient to exhale all possible air before coughing, which is immediately followed by deep inspiration, are to be avoided, as they break up the selective collapse. The spirometer should not be used in any case suspected of recent activity for the same reason. All exercises involving increased respiration are contraindicated.—*Selective Collapse in Pulmonary Tuberculosis, N. Barlow, J. Am. M. Ass., December 9, 1923, lxxxi, 1944.*

Accessory Pneumothorax after Artificial Pneumothorax.—In a case of severe pulmonary tuberculosis, with large cavities in the upper lobe, artificial pneumothorax achieved a good collapse of both lung and cavities. The moderately high pressure caused a large accessory pneumothorax in front of the heart and large vessels,

and there developed an exudate besides, that did not show on the roentgen plate. The pressure of the accessory pneumothorax resulted in sudden death that was expected. The formation of the accessory pneumothorax is to be ascribed to the presence of the so called "weak point in the mediastinum." Prophylactic measures to protect against this did not suggest themselves.—*Beitrag zur Kenntnis der Pneumothoraxnebenhöhlen, F. Kellner, Beitr. z. Klin. d. Tuberk., December, 1922, liii, 405.*

Pleurisy with Effusion on Side Opposite to Artificial Pneumothorax.—A case of rarely occurring exudative pleuritis on the side opposite to an artificial pneumothorax is reported. Fourteen days after the induction of pneumothorax on the right side there occurred a *pericarditis externa* and, four days later, an exudative pleuritis on the left side. The author believes that the extension was by continuity from the pericarditis to the pleura of the opposite side. The outcome was favorable.—*Pneumothorax artificialis, Pericarditis externa, Pleuritis exsudativa der Gegenseite, W. Lindig, Beitr. z. Klin. d. Tuberk., February, 1923, liv, 293.*

Plastic Pleurisy in Artificial Pneumothorax.—All forms of exudate occurring during the course of artificial pneumothorax treatment deserve serious consideration. This is especially true in those in which the next refilling does not produce complete collapse and stringlike or bandlike adhesions are found. All these exudates, even though they may appear harmless, should be considered serious complications, and their causes removed as soon as possible.—*Über plastische Pleuritis bei künstlichem Pneumothorax, A. Winkler, Beitr. z. Klin. d. Tuberk., March, 1923, liv, 335.*

Rupture of Pleura in Artificial Pneumothorax without Cavity.—Secondary tuberculous pyopneumothorax in the course of artificial pneumothorax occurs mainly as a result of a rupture of a cavity. A case is reported in which pyopneumothorax occurred without rupture of a cavity. Clinically, the case had all the marks of such a rupture. At autopsy, however, none could be proved, but two pulmonary tuberculous nodules were found to extend through into the pleura. The chloroform test was tried, but did not reveal a communication between the pleura and mouth during life.—*Tuberkulöse Usur der Lungenpleura bei künstlichen Pneumothorax, F. Jessen, Beitr. z. Klin. d. Tuberk., November, 1922, liii, 347.*

Fatal Gas Embolism after Oxygen in Artificial Pneumothorax.—As found by Brauer in animal experiments, a case of fatal gas embolism occurred following oxygen pneumothorax treatment. The case was considered tragic, since autopsy revealed no more active tuberculous processes in the lungs and pneumothorax had had an entirely satisfactory effect on the tuberculosis.—*Gasembolie nach Sauerstoff, H. Wörner, Beitr. z. Klin. d. Tuberk., February, 1923, liv, 296.*

Surgical Treatment of Tuberculosis.—Surgery is rapidly coming to be a valuable adjunct to the medical treatment of tuberculosis, but naturally it is useable only in certain cases. When the mixed empyema, which so frequently complicates artificial pneumothorax, fails to clear up under antiseptic washing, surgical intervention with thoracotomy and drainage becomes imperative. The operation may be done under local anesthesia and consists in the resection of a short piece of the eighth or ninth rib. Incision is in the posterior axillary line and includes the parietal pleura. The Carrel-Dakin method is then kept up until the pyogenic bacteria have disappeared, after which either radical thoracoplasty is done, if the lung is so involved with tuberculosis as to make collapse desirable, or the lung is allowed to expand. Surgical intervention is indicated in two other types of tuberculosis: (1) when adhesions make artificial pneumothorax impossible and (2) when unilateral cavitation has made it advisable that the lung should never be allowed to expand. Full thoracoplasty with phrenic nerve resection produces more lung rest than pneumothorax. Apicolysis is an extrapleural compression method, characterized by separating the visceral and parietal pleurae over the cavity and implanting fat in the space thus made. The cavity is largely obliterated. Improvement or arrest follows in about 75 per cent of cases of thoracoplasty. Surgery in no way should take the place of medical treatment which should be continued.—*The Selection of Patients and of Operation in the Surgical Treatment of Pulmonary Tuberculosis, H. Lilienthal, Am. J. Surg., January, 1924, xxxviii, 1.*

Surgical Treatment of Pulmonary Tuberculosis.—Thoracic surgery, a last resort in pulmonary tuberculosis, has earned a definite place as a therapeutic measure. In unilateral pulmonary disease subperiosteal resection of all the ribs from the first to the eleventh is done posteriorly. From 4 to 8 cm. is removed. The ribs fall toward a vertical line, reduce the thoracic cavity as

much as 50 per cent, and this very materially limits breathing on the operated side which affords rest to the lung. Indications for the operation, which at best is attended wth a serious mortality rate, should be unilateral disease, cases in which pneumothorax is impossible (with exceptions) and cases which have good general resistance and capacity for fibrous tissue formation. Fever, tachycardia, copious sputum or tuberculosis elsewhere in the body need not contraindicate the operation. Combination of gas with local anesthesia gives best results. Alcohol injection of the intercostal nerve trunks to prevent subsequent pain is ill advised. Of 37 cases there were three early deaths (within two months of the operation) and nine late deaths (two months to three years after operation). Many of the others showed marked improvement with ability to return to work; some remained unimproved.—*The Surgical Treatment of Unilateral Pulmonary Tuberculosis, E. Archibald, Am. J. Surg., February, 1924, xxxviii, 17.*

Surgical Treatment of Pulmonary Tuberculosis.—A review of the methods of surgical treatment of pulmonary tuberculosis from the advent of Forlanini to Jacobaeus shows that great advances have been made. —*Über die Indikationen zur chirurgischen Behandlung der Lungentuberkulose, G. Baer, Klin. Wchnschr., August 20, 1923, ii, 1581.*

Progress of Surgery of Lungs and Pleura.—In the treatment of all abscess cavities two things are essential, namely, free drainage and approximation of cavity walls. The application of these fundamental principles to the lungs and pleural cavity is a more difficult matter than elsewhere, but the problem has been faced during the last twenty years and rewarded with increasing success as technique and knowledge have improved. Years ago the necessity of draining pus from the pleural cavity was recognized, and drainage is still the essential factor. That being obtained, the lung easily reëxpands and obliterates the space. When drainage is delayed, reëxpansion of the lung is inhibited by fibrinous deposits and pleural thickening, and the dead space cannot then be obliterated without further measures. Thoracoplastic resections, decortication and discission were then introduced, but the greatest advance has been in the recognition of the importance of and prevention of chronic empyema cavities. Chronic empyemata are much more easily prevented than cured. In most cases they are the sequel of an acute or subacute pyogenic pleural infection, which, if diagnosed and treated early enough, will always heal. Oxygen replacement of serous effusions has been a big advance and the method has been extended to the removal of blood and pus from pleural cavities. Its rationale is based on the knowledge that a lung which has been steadily and increasingly compressed over days or weeks is incapable of complete reëxpansion in the course of a few minutes. During ordinary expiration very marked negative pressures are often produced. The lung reëxpands fairly rapidly up to a certain point, and then symptoms appear, due to the drag on pleuropulmonary adhesions or atelectatic tissue, and aspiration must be abandoned. If the degree of negative pressure is controlled by running in oxygen to replace part of the liquid, practically the whole effusion can be removed without discomfort. The oxygen is passively replaced, in part, by other gases, when the pathological condition of the pleura is active, or, when not, by reëxpanding lung. At each successive aspiration a greater negative pressure is tolerated and a greater reëxpansion of the lung is obtained, except in longstanding cases when the visceral pleura is too dense to yield to traction. The extension of oxygen replacement to cases of sterile and tuberculous pyothorax has ensued and is the most efficient method of treating such cases. In acute empyema an alternative measure is repeated aspiration and irrigation through a fine drainage tube left *in situ*. The tube is introduced through a cannula inserted with trocar and then withdrawn. The tissues then grip the tube tightly enough to prevent leakage. Every few hours the reaccumulated pus is withdrawn by means of a bulb syringe and the cavity washed with Dakin's solution in the same way. Later a 2 per cent formalin in glycerine solution is employed. The tube is removed when the secretion becomes sterile. The introduction of oxygen between inflamed pleural surfaces in dry pleurisy immediately relieves the pain due to their friction. The two essential principles, drainage and approximation of walls, are of paramount importance in acute and chronic pyogenic lung infections, gangrene and abscess. The lung itself is normally an elastic structure kept expanded by the negative pressure and surface tension between the pleural membranes. The thoracic walls are rigid, yet capable of some yielding and can accommodate themselves to a small degree of shrinkage. If the shrinkage in lung volume is too great, the force of contraction of the fibrous tissue is exerted on existing cavities and spaces, and this is responsible for the persistence of pathological cavities and dilatation and distortion of the bronchi. In gangrene and acute abscess the chief prob-

lem is location and efficient drainage; in chronic abscesses there is also the difficulty that the cavity is surrounded by walls which do not easily yield and are difficult to approximate. When there is a communication between the abscess or abscesses and the bronchi, open operation alone will leave a permanent fistula, and other measures are called for. Attempts to excise a lobe or a lung have been made in cases of bronchiectasis and old chronic fibroid phthisis. Such operations are very drastic and liable to complications. Artificial pneumothorax has proved its value and efficiency. Unfortunately, its usefulness is limited not only by the extent of the disease, but also by pleural adhesions, and in bronchiectasis its value is further limited by the fact that the epithelium-lined bronchial walls fail to approximate and permanently obliterate spaces, as happens in cavities lined by granulation tissue. Adhesions, if not too extensive, may be overcome by rupture or stretching by increasing pressures or by division. Division may be accomplished by the electric cautery, introduced through a cannula, while a view is obtained through a thoracoscope, by the use of a special tenotome with the aid of the fluoroscope and by open operation through an intercostal space. All these methods entail certain risks. Careful preliminary study with the aid of the X-rays is essential. Some adhesions have moderately large vessels running in them and the point at which lung substance ends may be difficult to determine. When artificial pneumothorax fails, other and more radical measures are to be considered. Extrapleural pneumolysis is accomplished by stripping the parietal pleura from the chest wall and displacing the lung mesially with it, plugging the exterior space with some substance, as air, wax, fat or muscle. The operation is not serious and a few gratifying results have been obtained with upper lobe cavities, but there have been many failures. Thoracoplastic operations, necessitating more or less rib resection, are much more serious, and carry a direct operative mortality of 8 to 10 per cent. The collapse obtained, though less than in a completely successful pneumothorax, is effective and permanent. The constitutional strain of the operation is serious. The combination of general with local anesthesia is to be preferred, as causing less shock than either alone. This may be supplemented by injection of the intercostal nerves with 2 per cent novocaine followed by absolute alcohol. This abolishes most of the pain during convalescence. The posterior paravertebral method of approach, recommended by Sauerbruch, is now universally employed and portions of as many ribs removed as is necessary. In children, the axillary route (Bull) is very efficient. The chief difficulty is the all important one of resection of the first rib. If both upper and lower ribs are to be resected, two stages are advisable. Localized or partial thoracoplasty is not recommended. In the case of basal lesions, paralysis of the diaphragm by phrenicotomy may, however, supplement a partial thoracoplasty. Phrenicotomy may also be required as an accessory to pneumothorax, when the diaphragmatic pleural surfaces are adherent and either collapse of the lower lobe is inadequate or the lung drags on the diaphragm and causes incessant dry cough. Phrenicotomy may be indicated in chronic unresolved pneumonia to prevent bronchiectasis by favoring retraction of the dome of the diaphragm and greater shrinkage of the lower lobe. In pulmonary tuberculosis all these operations come under consideration only after pneumothorax has been tried and found impracticable. There is also much reason to favor a preliminary trial of pneumothorax in cases of abscess and bronchiectasis. In unilobar bronchiectasis ligature of the corresponding branch of the pulmonary artery has had some success, but is an operation of considerable magnitude.—*The Progress of Surgery of the Lungs and Pleural Cavity, H. M. Davies, Tubercle, October, 1923, v, 1.*

Anesthesia in Thoracic Surgery.—Governing the choice of an anesthetic are certain considerations, some of which are peculiar to this form of surgery: *1.* Freedom from movement is of considerable importance, to avoid loss of time in readjustment of position. *2.* Exaggerated, irregular or hurried respiration must be avoided. *3.* Anesthesia must not be so deep that the cough reflex cannot be quickly reëstablished. *4.* The position required by the surgeon increases the administrative difficulties. *5.* Postoperative shock, bronchitis, bronchopneumonia and the dissemination of tuberculosis must be avoided. The position required of the patient is generally on the side, with the affected lung uppermost, or sometimes almost prone. The patient must not be placed in this position until anesthesia is sufficiently deep. The depth of anesthesia is a matter of experience. Rhythmical breathing and some degree of relaxation are required. The reflexes will not be abolished if gas and oxygen are used. The chief methods of anesthesia in general use are gas and oxygen, intratracheal ether, chloroform and oxygen. Rectal ether is sometimes chosen, but there is difficulty in controlling the degree of anesthesia and in reducing it when necessary. Local anesthesia is not

considered, as being in the realm of the surgeon rather than the anesthetist. *1. Gas and oxygen:* Its success depends largely on attention to detail. About an hour before operation an injection of one-quarter to one-third grain of morphine is given, the eyes are bandaged and the ears are plugged with cotton wool. The administration of the anesthetic is commenced by starting a steady flow of gas and oxygen through the apparatus and applying the face-piece slowly. Induction must be gradual, and any stimulation of the patient tends to interfere with it; therefore, he must not be moved until well under its influence. Just before the surgeon makes his skin incision, anesthesia should be deepened by increasing the gas pressure. The patient must not be held down, although there will be movement when the incision is made. The depth of anesthesia may again have to be increased when intercostal nerves are reached or ribs resected. Here a few breaths of chloroform may be given. The chief disadvantage with gas and oxygen is the shock which develops some hours after operation. An injection of morphine should be given before the patient leaves the table, and in addition 10 minims of 20 per cent camphor in oil. *2. Intratracheal ether insufflation:* This is unsuitable for tuberculous cases or where there is a connection between an abscess and bronchus. To pass the intratracheal catheter, preliminary anesthesia by the open method is necessary. When the surgeon begins to sew up the wound, the ether should be turned off and the lungs washed out with a steady flow of air. *3. Chloroform and oxygen:* This form of anesthesia is suitable for any thoracic operation, except that myocarditis prohibits its use. It allows of rather deeper anesthesia than the other methods and hence reduces shock. The simplest method is to use an open mask beneath which a gentle stream of oxygen can be introduced. *Complications:* These should be confined to bronchitis, bronchopneumonia and shock. Oral sepsis predisposes to bronchopneumonia. When possible, the subject should for several days previously use a good mouth wash and hard toothbrush, and the gums should be painted with 2 per cent iodine. Patients showing any signs of nasopharyngeal catarrh should receive at once the treatment for postanesthetic bronchitis, consisting of a steam-kettle and tent and four-hour injections of adrenalin (1–1000) 5 minims, strychnine one-sixtieth grain, and atropine one-one-hundred-and-fiftieth grain. There is always considerable shock. Heat is most important in combating collapse, and camphor, strychnine or morphine may be given in addition.—*Anesthesia in Thoracic Surgery, L. W. Shelley, Tubercle, October, 1923, v, 13.*

Indications for Phrenicotomy.—The effect of an artificial pneumothorax is attained when not only a sufficient compression is accomplished but also complete rest of the lung. Adhesions, especially to the diaphragm may prevent this. In such cases phrenicotomy is useful. Severe hemoptyses were brought to a standstill by the combined treatment, when pneumothorax alone failed. The pneumothorax gas also absorbs more slowly during this combined treatment.—*Kombination von Pneumothorax und Phrenikotomie als Therapie der Lungentuberkulose, A. V. Frisch, Beitr. z. Klin. d. Tuberk., November, 1922, liii, 341.*

Combined Surgical and Chemotherapeutic Treatment of Tuberculous Lung Cavities.—*A: Mechanical Factors in the Genesis and Progress of Pulmonary Tuberculosis, W. A. Gekler.*—The great amount of investigation along immunological lines has caused the mechanical factors operating in the lungs to be more or less generally overlooked. Physiologically speaking, the lungs consist of an upper and lower portion, the dividing line being the attachment of the trachea to the spine and its bifurcation. The forces that apply to the lungs in inspiration are greatest in the diaphragmatic and lower lateral portions, where the thoracic walls make the widest respiratory excursions. It is doubtful whether the extreme apex, above the first rib, moves at all in ordinary respiration. In childhood the tracheal attachment is high, so that the upper parts of the lungs constitute not more than one-fourth or one-fifth of the whole. At present the preponderance of evidence indicates that primary childhood infection occurs by aspiration of living bacilli into the lower parts of the chest, just as are inhaled dust particles. In childhood the prevailing manifestation of intrathoracic tuberculosis is involvement of the bronchial nodes, with more or less extension thence along the lymph channels. When it reaches the surface it manifests itself usually at the apex; the extension is by continuity as a tuberculous lymphangitis, occurring most readily in those areas moving least on ordinary respiration. Whether obstruction to the lymph flow, for instance, at the hilum nodes, must first occur, is an open question. The clinical picture, however, of peribronchial or interstitial tuberculosis is well known, and this is the true incipient tuberculosis of text books. Contrary to common conceptions pulmonary consumption does not always begin at the apices and extend downward. Many cases show a comparatively free apex, the greatest consolidation or cavitation lying between the clavicle and tracheal bifurcation. Such consolidations, according to

Nicol, are caused by aspiration down the bronchial tree of tuberculous pus. One constant characteristic of phthisis is the regular expectoration of purulent bacillary sputum. A patient having a persistently positive sputum over a long period should be regarded as having a cavity, excepting cases with discharging bronchial lymph nodes, and tuberculous bronchiectasis, both clinically infrequent. The mobilization within the lungs of tuberculous pus materially aids the spread of the disease, especially when accompanied, as commonly, by excessive cough, with its phases of sudden increase and decrease in intrathoracic pressure. Thus, in any patient with an open tuberculous lesion, in most cases a pulmonary cavity, it is only a question of time until aspiration of pus into healthy lung will occur, followed by a spread of the disease. Clinically, barring sudden accidents, as profuse hemoptyses and spontaneous pneumothorax, patients with open discharging cavities are either killed by gradual extension with eventual exhaustion of the patient, or by such complications as intestinal, kidney or meningeal tuberculosis. For this reason therapy should be directed to ending this mobilization of tubercle bacilli. *B: Surgical Aspects of Cavity Sterilization, W. R. Lovelace.*—The work with artificial pneumothorax has been the starting point for most of the methods hitherto employed. This led to the thoracoplastic resections of Friedrich, Wilms, and Sauerbruch, all of which, however, entail certain unavoidable possibilities of danger: the already impaired vital capacity may be reduced to the danger point; the wear and tear on a myocardium weakened by long toxemia may result fatally, and the trauma or shock itself may cause death in a weakened patient. Moreover, large anteriorly located cavities cannot be satisfactorily collapsed by any posterior plastic operation. Therefore, the opening of tuberculous cavities with a view to chemical sterilization was carried out in three patients, the final opening through the pleura being made with the thermocautery. Contained secretions were aspirated prior to chemical applications. None of these patients, except one who was in extremely poor condition, showed any alarming sequellae, and reactions were less than is usual with cases of nontuberculous lung abscess. The existence of extensive adhesions must, of course, first be ascertained before opening the pleura. *C: Chemical Sterilization of Large Tuberculous Pulmonary Cavities, H. P. Rankin and B. J. Weigel.*—The success achieved with chemotherapy in empyema for several years, and particularly in one case of lung abscess by direct application of gentian violet through an operative fistula, suggested the possibility of direct application of antiseptics to the interior of one of these pulmonary cavities. At first the attempt was made to carry out the injection through a needle, but the overflow of the dye into a bronchus set up violent coughing, with aspiration into other parts. In another case a mild chemical bronchitis was set up. In this work gentian violet was used on account of its affinity for gram-positive microörganisms, and several years' experience in treating empyema. It was known that even concentrated solutions were not destructive for tissue and the problem was to keep sufficient and prolonged contact with the tubercle bacilli. This led to the consideration of surgical exposure of the cavity. In the first case treatments were given at first every three hours with a saturated solution of the dye in 10 per cent alcohol in distilled water. After aspiration of secretions through a catheter attached to a 10-cc. syringe and lavage with physiological sodium chloride solution applied with an atomizer and aspirated, the walls were thoroughly saturated with the gentian violet solution, likewise applied and the excess dye removed. Under this treatment the temperature fell to normal and granulations appeared on the internal surface of the cavity. After a month, treatment was changed to a 4 per cent solution of medicinal methylene blue in 5 per cent glycerine, 15 per cent alcohol and 80 per cent distilled water. Medicinal methylene blue has an inhibiting action similar to gentian violet, but is more rapidly absorbed. The external chest opening never showed evidence of infection, but on the contrary was difficult to keep open. The cavity in this case progressively shrunk until it became little more than a sinus, with very little or no secretion. In another case treated with a 1 per cent medicinal methylene blue the secretions became very thin and steadily decreased. The gentian violet will definitely control the usual secondary infection and markedly diminish the tuberculous infection, while the methylene blue is even more deleterious to the latter and in no way inhibits repair.—*Tuberculous Cavitation of the Lung: Mechanical Factors in its Genesis and Combined Chemotherapeutic and Surgical Treatment, W. A. Gekler, W. R. Lovelace, H. P. Rankin and B. J. Weigel, J. Am. M. Ass., Feburary 9, 1924, lxxxii, 457.*

Comparative Value of Sodium Morrhuate in Tuberculosis.—It is recalled that tuberculin was used by many after Koch in the treatment of tuberculosis, and by some in considerable dosage, and that many of these patients are still alive and well.

However, it did not seem a suitable treatment for ambulatory cases, on account of occasional severe reactions. Sahli's method of very minute and slowly increasing doses obviated some of these disadvantages, and in extrapulmonary and the earlier stages of pulmonary tuberculosis the results were superior to Koch's method. In these cases, absorption of toxin being almost absent, or deficient, small doses suffice to set in motion the immunizing process; on the other hand, in advanced tuberculosis the whole system is already, so to speak, saturated with toxin. In 1919 Rogers published a short account of the treatment of tuberculosis by subcutaneous, intramuscular or intravenous injections of the sodium salts of the unsaturated fatty acids of codliver oil after ether extraction, which he called sodium morrhuate. He suggested that the effects of this substance depend not so much on the reactive powers of a patient as on direct attack on the coating of the acid-fast bacilli. Boelke is so impressed with the superiority of this method of treatment that she would not withhold it from an almost dying patient. Case histories are cited showing remarkable improvement in very ill patients in all stages. The injections are not painful, and it is a safe remedy in comparison with tuberculin. The strength of solution employed is 3 per cent. to which 0.5 per cent phenol has been added after sterilization in the autoclave. Solutions should be clear or become so on heating. Initial doses for subcutaneous or intramuscular injection are 0.1 to 0.2 cc., increased by 0.1 cc. at intervals of three to seven days, up to 1 cc. or more. Larger doses intravenously yielded no better results. —*The Treatment of Tuberculous Diseases: The Efficacy of Sodium Morrhuate Injections Compared with Other Treatments, P. W. R. Boelke and C. H. Sydney, Brit. M. J., December 29, 1923, no. 3287, 1249.*

Krysolgan Treatment of Pulmonary Tuberculosis.—Good results were obtained in the treatment of pulmonary tuberculosis by starting with small doses of krysolgan, allowing sufficiently long intervals (2 to 3 weeks) between injections and carefully selecting the cases for treatment, with preference for the nonfebrile productive-nodose and nodose-cirrhotic forms. Ths treatment can be used in cases in which other treatments with reaction are prohibited. Of 180 treated cases, 103 were favorably and 41 slightly influenced and 36 gave no results. Weight increase occurred in 134 and decrease in 10. Expectoration decreased in 91 and increased in 19; 12 cases became closed and remained so. Of 120 satisfactorily treated open cases, 28 lost the bacilli from their sputum and of 49 unsatisfactorily treated only 5 became free.—*Über Krysolgantherapie der Lungentuberkulose, A. Kolbmann and P. Wiessner, Beitr. z. Klin. d. Tuberk., March, 1923, liv, 325.*

Copper Treatment of Pulmonary Tuberculosis.—After an exhaustive review of the literature, experimental and clinical, the author's own studies are reported. A specific action of copper upon tuberculosis is extremely questionable. It is more probable that it reinforces the resisting powers of the diseased body. Copper acts favorably on tuberculosis. In small doses, at repeated intervals, at least 12 to 15 injections are necessary. The best results are obtained in new processes but chronic advanced cases are also favorably influenced. At the close of sanatorium treatment 76 per cent of the cases revealed improvement. After ½ to 3 years 63 per cent were capable of working and 13 per cent clinically healthy. Copper is contraindicated in highly progressive or miliary tuberculosis; and in these cases it is not only valueless, but may be harmful. In all other cases harmful effects were never observed. The favorable influence seems to persist for 4 to 6 months. Especially valuable seems the combination copper and tuberculin treatment. Copper is not a "tuberculosis cure" but it is a valuable aid.—*Die Kupferbehandlung bei Lungentuberkulose, Gabrielle Pohl-Drasch, Beitr. z. Klin. d. Tuberk., March, 1923, liv, 411.*

Copper and Salicylate Preparations in Tuberculosis.—Title only given.—*On the Chemotherapeutic Action of Copper and Salicylate Preparations against Tuberculosis, M. Tsuzuki, Kekkaku Zasshi, April, 1923, v, no. 10, Title from Japan Medical World, December, 1923, iii, 274.*

Calcium Therapy.—A short favorable clinical report on 5 cases treated with calcium salts.—*Kalktherapie, Gertrud Hartwich-Borrmann, Ztschr. f. Tuberk., December, 1922, xxxvii, 193.*

Histological Effects of Ectebin.—Ectebin is a tuberculin preparation used by administration percutaneously. It is supposed to be more active than Petruschky's liniment and resembles Ponndorf's vaccination, and can be rubbed into the skin since it contains keratolytic substances. Besides tuberculin there are present killed bacilli to prolong its action and enhance it. As a result of studies on pieces of skin removed from the site of inunction and reaction in children, it was found that the bacillary bodies penetrate the deeper layers of the skin and are there

gradually dissolved.—*Histologische Untersuchungen zur Tuberkulosetherapie mit Ektebin, K. Gottlieb, Beitr. z. Klin. d. Tuberk., December, 1922, liii, 423.*

Treatment of Advanced Pulmonary Tuberculosis with Gamelan.—*Gamelan* is preparation *671 E* of Jentzer, Marković and Raskin. It consists of complicated lipoids and fats, and should increase the lipolytic resistance of the body, destroy the fatty groups of the tubercle bacillus, and thus decompose the bacilli. In relation to nonspecific therapy two immunobiological questions are discussed. The first, whether fats and lipoids can act as antigens, is answered affirmatively; and the second is whether nonspecific therapy can build up specific resistance to the tubercle-bacillus fats. Fifty-eight cases, prognostically unfavorable, were treated for over three months. In 14 no improvement occurred, in 26 there occurred a detoxication without a tendency to healing, and 18 showed subjective and objective improvement. The activity and clinical value of the preparation, when given subcutaneously and percutaneously, is also gratifying in severe cases of phthisis.—*Erfahrungen in der Behandlung vorgeschrittener Fälle von Lungentuberkulose mit Gamelan, F. Mattausch, Beitr. z. Klin. d. Tuberk., February, 1923, liv, 228.*

Increase of Tuberculin Potency through Nonspecific Substances.—Injections of tuberculin which had been previously diluted with *Yatren* solutions result in a marked increase in the reactions caused by the tuberculin, although the addition of this nonspecific substance is in amounts giving no reaction of any kind alone. The increase is especially conspicuous with the tuberculin fractions, and less so with the individual partigens.—*Steigerung abgestimmter Reaktionen durch unabgestimmte Reizmittel, E. Springut, Beitr. z. Klin. d. Tuberk., December, 1922, liii, 450.*

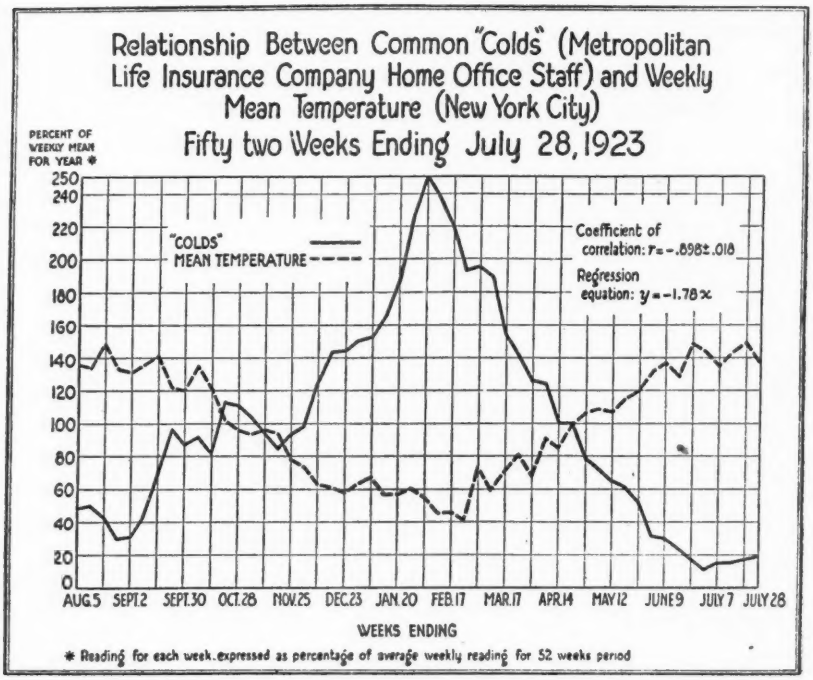
Intervals between Tuberculin Injections.—The author gives small doses of tuberculin at intervals of 3 weeks, using the *sensibilisierte Tuberkelbacillenemulsion Höchst.* Dörr and Berger, using the micro-method of Reiss and Röhrer, found a total increase in protein content of the serum, after parenteral administration of protein following a brief negative phase. This occurred as an increase of the fibroglobulin, then of the seroglobulins, and finally of the serum albumins. The leucocyte curves are influenced by too many factors to be a reliable index in determining the intervals for tuberculin injections. Rodenacker believes that further studies of the intermediate protein metabolism will be valuable as an aid in determining the best intervals for tuberculin administration.—*Die Pausen zwischen den einzelnen Tuberkulin-Einspritzungen, Rodenacker, Beitr. z. Klin. d. Tuberk., November, 1922, liii, 335.*

Prognostic Value of Urochromogen Reaction.—A constant and (with increasing dilution) positive urochromogen reaction is not an infallible prognostic test for tuberculosis. Inconstant reactions indicate progress for the worse but from this no certain prognostic conclusion can be drawn.—*Die Weisssche Urochromogenreaktion und ihr prognostischer Wert in der Beurteilung der Lungentuberkulose, A. Rustemeyer, Beitr. z. Klin. d. Tuberk., November, 1922, liii, 261.*

Disinfection Practice.—The all too schematic disinfection practice is opposed. Intelligence and clear reasoning are necessary, from the standpoint of both the diseased individual and the contact. Superfluous measures distract from those most essential. The execution of the measures must be under the guidance of most intelligent hands. In tuberculosis a lessening of the burden is preferred. The disinfection of books and objects which have been touched by contaminated hands is just as superfluous as the disinfection of stools and urine in intestinal or renal tuberculosis. It is even maintained that outside of sanatoria the disinfection of sputum is not necessary, only the cleaning or disinfection of the sputum cups being essential. The use of sputum flasks is to be reserved for inside of rooms but not on the street or in the open.—*Desinfektionspraxis, Neufeld, Centralbl. f. Bakt., I. Abt., Orig., October, 1922, lxxxix, 28 and 65.*

Common Colds and Associated Infections.—Common "colds" are among the chief sources of lost time in industry. In a group of about 6,700 clerical employees of the Metropolitan Life Insurance Company at the home office, during the 52 weeks ending July 28, 1923, 2,824 colds which involved disability for work were reported to the medical division, which cares for the health of the clerical staff. These disabling affections occurred at a rate of 420.7 per 1,000 employees for the year. The average days of disability for this illness per person on the payroll for the year was 0.9, and the average days per case were 2.2. In all, there were 6,233 days lost in the year from these conditions, which included head colds or coryza, acute bronchitis and tracheitis. Other associated conditions were excluded because of the impossibility of determining in how many cases they were associated with common

colds. These infections of the upper respiratory tract have two periods of maximum incidence: the first following the advent of cool weather in the late summer and early fall; the second occurring during hhe following January or February when the coldest weather of the winter prevails. It has been suggested by Dochez and others that this signifies that there are two types of catarrhal fevers, one appearing in the early fall, succeeded by the other in midwinter, accompanied or followed by maximum incidence of severe infections of the respiratory system, including pneumonia, and by a somewhat general mixture and confusion of all types of respiratory infection. This leads to the suggestion of the dependence of one group of respiratory infections upon the other. Are the infections of the upper respiratory system in the early months of cool or cold weather the necessary foundation for the severe pneumonias that appear later? Others have suggested that we are confronted in this annual progression of respiratory disease only with gradually increasing virulence of many types of microörganisms. In the present series two cases of pneumonia were reported among these employees in December, one in the following March and seven in April. These insufficient data indicate roughly a time relationship that is consistent with the hypothesis above stated; but this is obviously subject to a further and more conclusive test from more extensive data. There is needed an adequate volume of records whereby the cases of upper respiratory disease in the earlier months of cool or cold weather can be related to the incidence of major respiratory infections of later months. The data also point out that there are very distinct relationships between these respiratory infections and changes in the weather conditions. For example, the number of common colds varies with the rise and fall of the weekly mean temperature. A drop in the weekly mean temperature of 10° carries with it an increase of eighteen common colds per week in this group of 6,700 people. On the other hand, such other weather elements as mean relative humidity and total precipitation show only a slight influence on the rise and fall of the incidence of common colds. The accompanying chart will be of interest in this connection. There are two important factors in connection with the prevention of infections of the respiratory tract: first, the annual downward swing of temperature and, second, the



possible relationship of the minor infections which arise in the fall and early winter to those occurring later on. The first, or ecological factor, can be compensated to a degree by proper attention to clothing, and to the ventilation and heating of our homes, work places and means of transportation. The second factor is still subject to further study and such inquiry may lead to important preventive measures.—*One Year of Common Colds and Associated Infections, Statistical Bulletin, Metropolitan Life Insurance Co., November, 1923, iv, no. 11, 1.*

Goitre and Tuberculosis.—A relation between goitre and tuberculosis is indicated by the following facts: primary tuberculosis of the thyroid gland is rare; goitres are usually observed in incipient or mild forms of tuberculosis; goitre patients seldom acquire tuberculosis, and then only in a mild form; insufficiency of the thyroid has been considered by clinicians an exciting factor in the development of tuberculosis; thyroidectomized animals show a diminished resistance to tuberculosis; patients in late stages of thyroid cachexia usually die of tuberculosis. Hoffmann claims in addition, and gives the case records ot ten patients to support his contention, that the development of tuberculosis is a not infrequent sequel to operation on the thyroid. It must be admitted that other factors than a specific thyroid deficiency are in part responsible for the observed sequel, such as operative trauma, blood loss, and lowered general resistance of the patient with exophthalmic goitre. But even taking this into account there seems to be a specific relation between thyroid loss and the development of tuberculosis. Hoffmann considers the thyroid a special means of defense against the disease, and hyperplasias of the gland a protective mechanism, and warns against operating without considering the possibility of a developing tuberculosis. The protective effect of the thyroid is probably exerted through its stabilizing action in calcium metabolism.—*Kropf und Tuberkulose, H. Hoffmann, München. med. Wchnschr., November 9, 1923, 1363.*

Necropsy Findings in Cases Simulating Pulmonary Tuberculosis.—All of these cases had been considered clinically as pulmonary tuberculosis, but proved later to be nontuberculous. The postmortem findings were worked out by the Department of Pathology at the University of California. It should be noted that in one of the seven cases the gross pathological diagnosis was tuberculosis, but the microscope disclosed, instead, malignant tumor, primary in the lungs. The incidence of primary, malignant disease of the lungs is probably greater than recorded, and should be considered in every obscure case of chronic pulmonary disease. At the University of California it has been higher than Barrow's 0.9 per cent. Carcinoma is four times as common as sarcoma. Dyspnea and oppression in the chest are among the most prominent symptoms. Hemorrhagic effusion is always suggestive. Roentgen-ray examination may or may not be of help in the diagnosis. Orthopnea is generally present as well as dyspnea. Pulmonary embolism was another condition wrongly diagnosed because of the fever, cough and blood spitting. The sudden onset of such symptoms, especially with severe chest pain, constitutes the classical picture of embolism, and the presence of an endocardial lesion renders the diagnosis still more probable. Pneumonokoniosis was wrongly diagnosed as tuberculosis in two cases, one with no suggestive occupational history. Physical signs of cavitation may be obtained over areas of dense pneumonokoniosis. Another case had a scirrhus carcinoma of the stomach not evident to the roentgen ray, with lung and other metastases. In this case annular shadows in the chest plate were diagnosed as cavities but no cavitation was found, but instead tumor nodules diffusely scattered about the blood vessels. Another case showed a mesothelioma of the pleura, arising from near the left apex, with extensions and metastases. Five such cases were recorded in 1600 necropsies and the physical signs of pleural density without effusion are suggestive. The last case was one of a metastatic lung sarcoma occurring eleven years after attempted removal of the primary growth. Orthopnea, asymmetrical dilatation of the superficial chest veins, with flatness and distant breath sounds without effusion, should have been suggestive.—*The Anatomic Findings in Cases Simulating Pulmonary Tuberculosis, G. Y. Rusk and V. Randolph, J. Am. M. Ass., February 9, 1924, lxxxii, 442.*

Alveolar Pores in Pneumonia.—The so called "pores" or communications between adjoining air cells which often can be seen in sections from acute lobar pneumonia are not normal, preformed structures. In acute lobar pneumonia one of the earliest stages is an inflammatory engorgement with serous exudate, which finally results in the classic red hepatization. The alveolar walls have for their centre a network of capillary blood vessels; outside the network of capillaries on each side there is a network of exquisitely fine fibrils (the reticulum), and outside this reticulum a layer of epithelial cells, which

in the normal fully distended lung are stretched out into thin squames. Due to the pouring out of the serous exudate into this restricted space, the epithelium is pushed off and the fibrils of reticulum may, at times, give way. Shedding of the epithelium constitutes but one step in the formation of a pore. If the epithelium on the opposite side of the alveolar wall remains intact, then no pore can result from the shedding of the epithelium, on one side of an aveolar wall. The epithelium on the opposite side of a given alveolar wall may be pushed off by the accumulation of serum behind it, but this must take place from diametrically opposite sides of an alveolar wall to play a part in the formation of a pore. In pulmonary edema the same shedding of epithelium takes place as in lobar pneumonia except that here the cause is mechanical and not inflammatory. Pores also exist in this condition.—*A Study of the Factors Underlying the Formation of Alveolar Pores in Pneumonia, W. S. Miller, J. Exper. Med., December 1, 1923, xxxviii, 707.*

Irritation of Respiratory Tract by Gases.—The toxicology of all irritants is the same; the different symptoms indicate different loci of their action. Irritants act by inducing inflammation, and initial reactions are either chemical or physical, but they are relatively slight and the symptoms are produced by the vital reactions of the body. Irritant gases act in great dilution and seldom produce corrosion of themselves. Selective action is physical and depends especially upon solubility. A gas, such as ammonia, is very soluble in water and diffuses into the first moist tissue it reaches, so that the upper respiratory tract is most harmed by its inhalation. By the time the gas reaches the lungs its concentration has been so markedly reduced that it does no harm. Conversely, such gases as phosgene or nitrogen peroxide, being less soluble, produce a maximum of damage in the depths of the lungs. Experiment proves this. Protective reflexes also greatly save the lungs when the larynx has been exposed, even to the point of acute asphyxia. The respiratory tract is increasingly sensitive and delicate, the further from the larynx. In laryngeal damage edema is likely to ensue and produce death. Pain is a conspicuous feature. The common lung damage is also edema, but this is painless and of unequal distribution because of an irregular bronchial constriction, with consequent protection of certain portions of the lung. Symptoms of this condition are those of an asphyxia without air hunger, but with ashy-gray color followed by blue cyanosis and then air hunger. This comes from a gradual development of anoxemia. Lobar or bronchial pneumonia also follows lung gassing, with symptoms similar to those of infectious, nonirritant pneumonias. They may follow gassing that was so slight as to produce no acute symptoms. Pulmonary tuberculosis may follow gassing but usually only after the gassing itself has undermined the subject's general health. Chronic lung inflammation with cicatrization and pockets of infection may be later results of gassing. Most gases are used up or neutralized in the respiratory tract but certain ones, such as nitrogen peroxide and hydrogen sulphide, are absorbed as sodium nitrite and sodium sulphite by the blood and produce poisonous results.—*Action of Irritant Gases upon the Respiratory Tract, H. W. Haggard, J. Industr. Hyg., February, 1924, v, 390.*

Hereditary Hemoptysis.—Seven members of a family presented identical histories of rather profuse hemoptyses occurring at intervals for years, beginning at puberty or in early adult life and not seriously impairing the general health. None of the seven ever developed any other symptoms suggesting tuberculosis and careful physical examination of three of the bleeders, with roentgenological examination of two of them, appeared definitely to exclude tuberculosis. Also, there were no cases of tuberculosis in the entire family, whose genealogy was studied for four generations. There were no abnormalities of the blood, both coagulation and bleeding time being normal, as well as the platelet count, and there were no telangiectases of the upper air passages, this being confirmed in two cases by bronchoscopy, so that if telangiectases existed they must have been localized in the finer bronchi or pulmonary tissue. The disease is apparently hereditary without skipping generations, and the tendency is probably a mendelian dominant. The only comparable recorded disease is the "idiopathic family hematuria" described by Apert.—*Hereditary Hemoptysis, E. Libman and R. Ottenberg, J. Am. M. Ass., December 15, 1923, lxxxi, 2030.*

Calcareous Degeneration in Thorax.—"Stone in the lung" is a condition that has been recognized for many years and is mentioned by Aristotle and Galen. The cause of calcareous degeneration has been the subject of much experimental investigation. A number of conditions have been held accountable for abnormal calcareous deposits in the various body tissues. In summarizing the evidence the following points may reasonably be considered as having some etiological bearing: *1:* Any irritant to the

tissue, either mechanical, chemical or infectious, the latter being a most important factor in the cases presented in this article. *2:* Any condition lowering vitality. *3:* Changes in the composition, velocity or volume of blood. *4:* Interference with the general or local nutrition. *5:* Any disease of the osseous system which may cause the liberation of lime salts. *6:* Alterations in the tissues which cause retention of chronic irritants, such as necrosis, suppurations and chronic inflammatory changes. *7:* Special selective power of certain tissues for lime salts. *8:* The effect of insufficient sunlight on the body tissues and metabolism. *9:* Hemorrhage into the tissues. There still remain a large number of unexplained cases of calcareous degeneration. Lime deposits most frequently appear in the lungs, pleura, gastric and intestinal regions, the blood vessels, lymph nodes, joints, tendons, cartilages and bursae. Calcification of the ribs and costal cartilages has often been mentioned as a suggestive sign of early pulmonary tuberculosis and has also been considered as evidence of predisposition to this disease. From a study of over 7,000 stereograms of the chest the author concludes as follows concerning the significance of this relationship: First, the number of cases with frank lesions in the upper part of the lungs, active or inactive, which show no definite signs of calcification in the thoracic cage is remarkable. Second, extensive calcification of the ribs or cartilages occurs frequently without any pulmonary disease. Third, the long, thin, flat narrow thorax may be more prone to calcification of the upper anterior part, but a number of calcified deposits were found in all forms and types of the adult thorax. The pleura is not an uncommon seat of frank calcareous deposits. Empyema, extensive and localized, is perhaps the most important cause. Most of these pleural calcifications are not due to the action of the tubercle bacillus. Roentgenology has proved the most important help in the diagnosis of calcareous degeneration. The dense, hard, concrete, clean cut shadow caused by this particular formation is characteristic. Few symptoms occur in the pathological formation of lime salts. When present they depend on the mechanical behavior of the concretions, the possibility of associated infection, their size and location, whether loose or impacted. The physical findings seldom give us much information in the diagnosis of calcium concretions in the chest. The deposit of lime salts is not necessarily a part of a healing or healed process. The article includes a report of cases and reproductions of roentgenograms.—*Some Interesting Cases of Calcareous Degeneration Found in the Thorax, J. S. Pritchard, Arch. Int. Med., August 15, 1923, xxxii, 259.*

Unusual Spontaneous Pneumothorax in Child.—In an eight-year-old child severe hemorrhage followed removal of adenoids. The pulmotor was applied. Three months later an asymmetry of the thorax developed with leftsided pneumothorax. The patient did poorly and in another month had a bilateral pneumothorax which was fatal.—*Ein ungewöhnlicher Fall von Spontanpneumothorax, Kohler, Klin. Wchnschr., November 12, 1923, ii, 2133.*

Chronic Bronchitis of Nasal Origin.—Chronic bronchitis of nasal origin is not mentioned in the text books and prior to 1910 not much reference to it is found in the literature. The intensive study of chronic coughs among the soldiers of the warring nations drew the attention of observers to the nasal origin of many bronchial diseases supposedly having a tuberculous foundation. Generally the history in those cases is, in the beginning, the syndrome observed in acute coryza. Tracheobronchitis is also present here, but the onset is not so acute nor the reactions so marked. Symptoms apparently persist for a longer time, varying in intensity from what we might regard as repeated acute flare-ups to a stage when there is constant slight annoyance. The symptoms never entirely disappear, but tend rather to become more and more persistent, until a chronic stage is reached in which the symptoms are well marked and quite definite. Among the symptoms is found always a persistent cough, usually but not invariably accompanied by more or less obstruction to nasal breathing, at times amounting to complete obstruction and manifest mouth breathing; this latter is termed the bronchitis of the corked nose. Close inquiry will disclose that these patients virtually blow their nose into the pharynx, which not only infects the lymphatics of the pharynx but produces a descending infection of the larynx and trachea. The most frequent sources of infection are chronic purulent ethmoiditis, adenoids, maxillary sinusitis, chronic purulent sinusitis and pansinusitis. There are three types of cases: 1. The infection appears to spread equally through the main branches of the bronchi and to the alveoli. This may lead to dilatation of the bronchioles. The cough varies, is influenced by atomspheric humidity and is increased on lying down. 2. *Tracheal or phlegmonous type:* It is characterized by severe painful paroxysms not unlike asthma, followed by moderate expectoration. This type is not accompanied by fever. 3. *Localized form:* In this the lung involvement occurs in patches, at times amounting to only a small spot, frequently near the apex. This kind is difficult to differentiate from pulmonary tuberculosis. The clearing up of the physical signs after a

short time is the chief point in the differential diagnosis. By way of treatment the nasopharynx and sinuses should receive proper attention. For the local condition autogenous vaccines are beneficial. Potassium iodide in average doses is good. Inhalations are of some value. General hygienic measures are helpful.—*Chronic Bronchitis of Nasal Origin, W. F. Von Zelinski, Med. Jour. & Rec., February 6, 1924, cxix, p. ix.*

Lung Abscess.—Early treatment—one might best term it prophylactic treatment—is of the utmost importance in beginning lung abscess due to aspiration. This treatment is bronchoscopy and should be done as early as possible even though the patient is deathly sick with chills and high fever, continuous cough and foul sputum. Artificial pneumothorax is to be resorted to only if repeated bronchoscopic suction with intrabronchial treatments fails. Even though a third of early cases of lung abscess due to aspiration heal spontaneously, bronchoscopy is indicated in every instance. In syphilitic cases the results are good with antisyphilitic treatment. In tuberculous cases, when artificial pneumothorax fails, thoracoplasty should be done. In bronchiectatic lung abscess the operation of choice is lobectomy. When a more conservative operation is preferable the formation of a lung-lip fistula is indicated.—*The Surgical Treatment of Abscess of the Lung, W. Meyer, Med. Jour. & Rec., February 20, 1924, cxix, 189.*

Lung Abscess.—Lung abscess is of more frequent occurrence than is commonly held or stated. Its clinical recognition is not always easy and the condition is often overlooked. Spontaneous cure occurs in a small percentage of cases. Lung abscess has a high mortality rate, 40 to 80 per cent, and when not resulting fatally there frequently ensues a pitiable state of invalidism. Lung compression, if done early, holds some promise; if done later, very little. Tonsillectomy by opening up venous sinuses in an infected area provides the opportunity for embolic invasion of the lung. Finally, a condition so frequent and so serious is deserving of intensive study both for its prevention and its cure.—*Lung Abscess, L. B. Mackenzie, Med. Jour. & Rec., February 20, 1924, cxix, 191.*

Gentian Violet in Empyema.—For many years the only fact worth knowing about empyema was that it followed pneumonia and that its treatment consisted in incision and drainage. This method of treatment often yielded a high mortality rate. There are three stages in the development of empyema: (1) the formative stage, (2) the acute stage and (3) the chronic stage. Any empyema in which frank pus is obtained is in the third stage. It is an end product or the terminal event of an infectious process, in which the first stage is a pneumonia with a small serous pleurisy, and the second a pneumonia with a greater exudate of seropurulent material; and the third stage is frank pus. The serous fluid becomes infected by an abscess which lies adjacent to the pleura. This abscess ruptures into the pleural cavity, thereby infecting the fluid contained there. This fluid, when infected, becomes seropurulent and at a later stage purulent. Serous or seropurulent fluids are free while purulent fluids are encapsulated. In the latter instance drainage can be accomplished without resulting lung collapse. The proper treatment for the acute stage of the disease is aspiration by some closed method, insuring that no air gets into the pleural cavity. The instillation of gentian violet is of great value in the form of treatment. Churchman has shown the definite relationship between the gram stain and the susceptibility to dye action, the gram-positive microörganisms being susceptible to gentian violet. Eighteen cases of empyema were treated with gentian violet, following Major's original technique. Under local anesthesia aspiration is done with a 50 cc. Luer syringe, connected to the needle by a piece of rubber tubing 2 or 3 inches in length, and fitted with adaptors. The fluid is aspirated until the cavity is almost dry, unless during the first aspiration there happens to be a large amount of fluid. Then one-half as much warm aqueous solution of gentian violet (1 to 2500) as fluid removed is slowly injected into the cavitiy. This fluid is allowed to remain until the next aspiration, which means from one to five days, depending on the individual case. During the second and following aspiration a solution of 1 to 1000 is used. In none of the cases treated was a rib resection done, all clearing up with the use of gentian violet. In 3 cases a chlorazene solution of 0.5 to 1 per cent was injected to dissolve the exudate which had coagulated and could not be aspirated until dissolved. The different types of microörganism seemed to have but little to do with the recovery of the patient. Type I pneumococcus showed a thick purulent exudate early, while type III and streptococcus fluids were seropurulent for some time. Gentian violet is recommended in the treatment of all acute empyemata in which the fluid is seropurulent, which indicates that adhesions are not formed and encapsulation has not taken place and pneumonia is still present. By this method a certain number will clear up without fur-

ther treatment. If they do not, no time is lost and the patient is in a better condition for surgical drainage when the proper time comes.—*The Use of Gentian Violet in the Treatment of Empyema, R. C. Davis, Am. J. M. Sci., November, 1923, clxvi, 743.*

Prevention of Rib Necrosis in Empyema.—While the United States Empyema Commission has decided that rib resection is necessary for proper drainage, statistics show that in about 4 per cent of cases osteomyelitis of the rib occurs, delaying convalescence and necessitating a second operation. The open marrow cavity of the cut rib is an avenue for sepsis and osteomyelitis, and these infections are extremely virulent, giving rise to long standing fever, sequestrum formation, general sepsis and anemia, and even death. Schwartz has so modified the usual operation as to seal up the open ends of the cut rib with bone wax, turning down muscle flaps to cover them. The pleura is then opened, the suction apparatus introduced, the pus slowly removed and, finally, a rubber-tube drain inserted and the skin closed with silkworm-gut sutures.—*A Modified Rib Resection Operation for Empyema, G. Schwartz, J. Am. M. Ass., December 5, 1923, lxxxi, 2017.*

Closed Surgical Treatment of Empyema.—During the war it was demonstrated that the closed method of treating acute empyema was simple, expedient, and satisfactory. Nevertheless, most surgeons still adhere to the open method. Some of the reasons are here explained. Many of the difficulties encountered are readily avoidable. Bettman has used the closed method during the last three years with success in a large group of empyema cases, especially among children, employing a modification of the army trocar method. The after-course is much more comfortable than with the open method, and the occurrence of chronic empyema very slight. The procedure is as follows: After preparation and anesthetization of the skin and underlying tissues, an exploratory puncture is made, and needle and syringe left *in situ* as a guide. A trocar is then forced through the chest wall into the empyema cavity. After withdrawal of the stilet a no. 14 French soft rubber catheter, clamped at its funnel end, is threaded through the trocar. The catheter must fit snugly and will require a lubricant for passage. After it has been inserted, the trocar is removed and the catheter held in place by adhesive tape or a rubber cuff, and not by a safety pin, which causes it to tear and allows ingress of air. The after-treatment consists of repeated aspiration of the empyema cavity and injection of Dakin's solution. It is advised to aspirate every two hours and reinject a quantity of solution equivalent to one-third of the aspirated pus. The aspirations and injections are continued throughout the twenty-four hours, and may be done without waking the patient. A possible source of trouble is the position of the catheter within the chest. Its excess length does not drop downward in the chest, but rather slides upward along the collapsed lung. Thus it may come to lie between the pleural layers and above the pus as the lung reëxpands. A roentgenogram will clearly show this, and it is then only necessary to withdraw a few centimetres of catheter to reëstablish drainage. Encapsulation of the empyema may also occur and necessitate changing the position of the catheter. The treatment is ended when all symptoms have subsided, when bacterial counts on the aspirated fluid are repeatedly negative and, most important of all, when the cavity has been obliterated. This must always be verified by roentgenography. In case the pleura is thickened so as to cast a shadow, a 12 per cent sodium bromide solution, which is opaque to the ray, is injected. Ths usual hygienic care and breathing exercises are recommended during convalescence; also plenty of fresh air and sunlight.—*Treatment of Empyema: Some Notes Explaining the Lack of Success of the Closed Method, R. B. Bettman, J. Am. M. Ass., February 2, 1924, lxxxii, 359.*

Treatment of Tuberculous Empyema and Pyopneumothorax by Boric Acid and Iodine.—Two cases of tuberculous pyopneumothorax, with streptococci and staphylococci as secondary invaders, are reported, in which the empyema was terminated without leaving a trace of pus by the use of boric acid irrigation combined with the use of Pregl's iodine solution.—*Erfolgreiche konservative Behandlung des tuberkulösen Empyems und Pyopneumothorax durch Borsäurespülung und Preglesche Lösung, R. Stahl and K. Bahn, München, med. Wchnschr., October 12, 1923, 1265.*

Pepsin-Hydrochloric Acid in Bülau Siphon Drainage Treatment of Empyema.—The disadvantages of rib resection in empyema are largely overcome by Bülau's procedure of siphon drainage of the pleural cavity. The Bülau method is applicable, however, only to those cases in which the pleural exudate is thin. Thick, fibrin-rich fluid fails to drain out, so that pus retention with fever occurs, and adhesions form. The fibrin acts, furthermore, as a protecting cover for bacteria. For two years the author

has used pepsin and hydrochloric acid in rendering the pleural content more fluid, with very satisfactory results. A tube 7 mm. in diameter is passed through the chest wall at the bottom of the fluid level, and held in place by appropriate fastenings. Through this as much fluid as possible is immediately removed. If the exudate is too thick to drain through the tube, a mixture of 20 parts of pepsin and two parts each of carbolic and hydrochloric acids in 400 parts of water, is injected into the cavity, where it is allowed to remain 6 to 12 hours. In this time marked digestion occurs and a thin fluid is easily removed. A single treatment is often sufficient, but if necessary the procedure may be repeated daily. The method is contraindicated in empyemata secondary to lung abscess and gangrene, bronchiectasis and those forms resulting from extension of subphrenic abscess, pericarditis, mediastinitis and perforation of the esophagus.—*Die Verflüssigung fibrinreicher Pleuraempyeme durch Pepsinsalzsäure als Hilfsmittel der Bülau Heberdrainagebehandlung, A. Herrmannsdorfer, München. med. Wchnschr., September 28, 1923, 1219.*

Pulmonary Syphilis.—Pulmonary syphilis is a rare disease. Osler found only 20 cases in 2800 autopsies. At the Massachusetts General Hospital only 1 case was found in nearly 5000 autopsies. The acquired type is discussed in this article. It may take the form of gummata or of an extensive fibrosis, sooner or later accompanied by bronchial stenosis with resulting ulceration and destruction of lung tissue. Until stenosis takes place, the disease may reach a fairly advanced stage in the lungs, with practically no symptoms except shortness of breath. This is one of the most striking symptoms of the disease. The process usually commences at the hilum, extending eventually toward the bases. The infiltrative type is most common and, when involving the apex, which it rarely does, closely resembles tuberculosis. Pulmonary syphilis is more frequent in negroes. Here it is a far advanced lung lesion with signs of consolidation, frequently in the left lung between the second and fourth ribs. When associated with symptoms of secondary syphilis it strongly resembles pulmonary tuberculosis. The lesion clears up rapidly on treatment. If tuberculosis is present salvarsan is usually preferable to iodide of potash. Repeated examinations of the sputum, together with a most careful history and thorough search for evidence of syphilis elsewhere in the body, rather than the result of physical examinations of the chest, must remain our most useful means of recognition. *Summary*: 1. Pulmonary syphilis is an extremely rare condition, although undoubtedly not recognized as frequently as it should be. 2. It may closely resemble tuberculosis or may exist along with tuberculous disease of the lungs. 3. Under no conditions can it influence tuberculosis favorably. 4. Given a patient with a definite syphilitic history, a positive Wassermann and signs of syphilis elsewhere, who has in his lungs, by X-ray and clinical examinations, evidence of an extensive, destructive process with the sputum constantly negative to tuberculosis, pulmonary syphilis should be strongly suspected. If this process is at the hilum or base, rather than the apex, the diagnosis of syphilis is still more likely. If the process under antiluetic treatment clears up rapidly, the diagnosis of pulmonary syphilis may be considered definite. 5. Treatment depends on early diagnosis. The possibility of tuberculosis being a factor in the patient's condition should, likewise, be borne in mind, and hygienic, constitutional treatment instituted along with antiluetic measures. In syphilis we treat the disease while in tuberculosis we treat the patient.—*Pulmonary Syphilis, J. B. Hawes, 2nd, Boston M. & S. J., January 17, 1924, cxc., 92.*

Influence of Syphilis on Tuberculosis.—Of 495 consumptives in all stages, 5.3 per cent had syphilis. In 19 the Wassermann was positive and 9 had definite clinical symptoms of syphilis. The influence of syphilis on the genesis and course of the tuberculosis was not uniform. The differences are explained as being due to a variable immunity. In early syphilis there is always the danger of activating a latent tuberculosis, especially in a weak constitution. With a strong constitution and a new syphilis added to a manifest tuberculosis, in rare cases the former can act favorably in the manner of nonspecific protein therapy. With an old syphilis and a new active tuberculosis the bodily constitution also comes into play in determining the outcome. In treating the double disease the following rules are followed: In latent tuberculosis and a weak constitution antisyphilitic treatment is to be used with care. However, in early cases salvarsan is to be preferred. The same rule is followed in early active syphilis with active tuberculosis. With a strong constitution tuberculin can be used at the same time. Old cases of syphilis with active tuberculosis should be given iodine. In the advanced stages of tuberculosis antisyphilitic treatment is to be avoided.—*Über den Einfluss der Syphilis auf Entstehung und Verlauf der Tuberkulose, R. F. Weiss, Beitr. z. Klin. d. Tuberk., February, 1923, liv, 165.*

Incidence of Syphilis among Tuberculous.—Numerous inquiries have been made as to the incidence of a positive Wassermann reaction among sanatorium patients. To investigate this a series of 500 cases in the city of Glasgow Sanatorium, Roboyston, was examined. Of these cases 223 were pulmonary and 277 nonpulmonary. Among the former group 9.42 per cent gave a positive reaction, and 5.05 per cent among the latter. It has been taught generally that syphilitics are particularly susceptible to tuberculosis. References to the literature purporting to support this view are cited. The results of this investigation do not uphold this impression. If the two groups of cases are taken together into one unit, it is seen that only 35, or 7 per cent, gave a positive Wassermann reaction. It is then not reasonable to suggest that the coexistence of the two diseases may be less common than is frequently stated, and that syphilis may not directly predispose to tuberculous infection. References in the literature are cited in support of this contention. *Conclusions:* 1. From a consideration of limited data the incidence of a positive Wassermann reaction has not been found to be more frequent among the tuberculous than among the general population. 2. Syphilis of the lungs existing as an isolated disease is extremely rare, as it may be that a number of cases recognized as pulmonary tuberculosis, and in which the Wassermann reaction is positive, are in reality cases of combined syphilis and tuberculosis of the lungs. 3. The two diseases when coexistent in the same individual may modify each other. 4. In cases, in which syphilis and tuberculosis are coexistent in the same individual, the administration of *606* and its analogues may be followed by disaster. If organic arsenic is used, it should be administered in extremely small doses and at wide intervals. If no disturbance follows the injections, treatment may be continued cautiously, but it should be at least temporarily suspended if local or general reactions occur, and the condition should be carefully watched. 5. Organic arsenic compounds may be useful in cases in which the diagnosis is doubtful, but it is unjustifiable to employ them for diagnostic purposes save with extreme care, and always having in mind the possibility of a tuberculous flareup.—*Syphilis as a Complication of Tuberculosis, A. K. Bowman, Lancet, December 15, 1923, ccv, 1288.*

Influence of Tuberculosis on Syphilis.—Of 5323 cases examined there occurred, among 1267 cases of active tuberculosis, 3.23 per cent of manifest syphilis, and among 4056 nontuberculous 9 per cent of syphilis. Since the majority of those with active tuberculosis die in the first three decades they do not live for the tertiary or metasyphilitic stages of syphilis. Tuberculosis has no effect on syphilis.—*Statistische Untersuchungen über den Einfluss der Tuberkulose auf die Lues, M. Landsberger, Virchow's Arch. f. pathol. Anat., 1923, ccxli, 392.*

Physical Findings in Pericarditis.—The diagnosis of a pericardial effusion is often a matter of great difficulty. The fact that the physical signs are not always distinctive led to the study of the problem experimentally. In these experiments, ascitic fluid was injected into the pericardium of fresh cadavers within four hours after death. It was found that the cardiohepatic angle is acute (at the most a right angle, but never obtuse) even after the introduction of 2 litres of fluid. The smallest amount of fluid causing a change in the percussion findings was 250 cc., but it was not until 500 cc. had been injected that definite percussion and roentgen-ray changes could be detected with uniformity. In a study of patients ill with pericarditis it was noted that, even with large accumulations of fluid in the pericardium, the apex impulse may remain visible and palpable and the heart sounds of good intensity throughout the course of the disease; and that, at times, a pericardial rub may persist along the left sternal border, near the base of the heart. *Conclusions:* 1. The cardiohepatic angle in pericardial effusion is usually an acute angle. 2. The area of relative cardiac dulness is pyriform and generally extends upward to the first interspace. 3. Widening of the area of dulness and of the shadow (roentgen) in the first and second interspaces occurs relatively early in effusion and is best determined with the patient in the recumbent posture. 4. Shifting dulness (that is, a narrowing of the dull area with a corresponding decrease in width of the shadow over the great vessels when the patient is changed from the recumbent to the erect posture) has proved to be the most reliable physical sign of fluid in the pericardium. 5. Widening of the dull area and of the shadow to right and left above the diaphragm when the patient is erect is found with fluid. 6. There is an absence or marked decrease of visible pulsation in the shadow fluoroscopically in pericardial effusion. 7. Dulness at the angle of the left scapula is often present with a large accumulation of fluid in the pericardium.—*The Physical Findings in Pericarditis with Effusion, R. S. Morris and C. F. Little, Am. J. M. Sci., November, 1923, clxvi, 625.*

Lung Volume in Heart Disease.—In heart failure it is assumed that the supply of oxygen to the tissues and the removal of carbon dioxide from them is not commensurate with the needs of the body. The reason for studying lung volume in heart diasase is that it aids in an understanding of the interdependence of cardiac and respiratory failure. The material for study was selected from a group of cases suffering from various types of chronic heart disease. In a number of instances the same patients were investigated during various stages of decompensation and compensation. The values found have been compared with those determined in a group of normal subjects. Lung volumes have been considered from three points of view: (1) relative lung volumes or subdivisions of total lung volume, (2) the absolute lung volumes of patients with heart disease have been compared with lung volumes calculated for normal individuals having similar surface areas or chest measurements, and (3) in individual cases absolute lung volumes have been measured in various stages of compensation and decompensation. *Conclusions:* 1. In patients with heart disease it has been observed that the vital capacity forms a portion of the total lung volume relatively smaller than in normal persons, and that the midcapacity and residual air form relatively larger portions. When the patient progresses from the compensated to the decompensated stage these changes become more pronounced. 2. When the absolute lung volumes determined for patients are compared with volumes of the same sort, as calculated for normal individuals of the same surface areas and chest measurements, the following differences are found: the vital capacities are always smaller in the patients and the volumes of residual air are always larger. There is a tendency for middle capacity and total capacity to be smaller, when the patients are in compensated state. These volumes may approximate normal. 3. When decompensation occurs the absolute lung volumes undergo changes as follows: vital capacity, midcapacity, and total capacity decrease in volume, and the residual air may either increase or decrease according to the severity of the state of decompensation. The significance of these changes is discussed and an explanation offered for the occurrence of a residual air of normal volume in patients with heart disease. This results from a combination of two tendencies working in opposite directions: one to increase the residual air—stiffness of the lung (*Lungenstarre*); the other to decrease it—distended capillaries (*Lungenschwellung*), edema and round-cell infiltration.—*The Lung Volume in Heart Disease, C. A. L. Binger, J. Exp. Med., October, 1923, xxxviii, 445.*

Tuberculosis as Factor in Hodgkin's Disease.—When a patient with adenopathy appears for diagnosis the examiner must consider the possibility of Hodgkin's disease, lymphosarcoma, lymphatic leukemia, syphilitic adenopathy, true malignant tumor and tuberculosis in making a differential diagnosis. Many times the clinical examination is insufficient, and a biopsy must be made before a diagnosis can be obtained. In the author's cases a differential diagnosis from lymphosarcoma has proved the most difficult. Three types of tuberculosis may simulate Hodgkin's disease: 1. An acute, comparatively rare form in which the lymph nodes on both sides of the neck swell rapidly, are painful and tender, and are associated with fever. These nodes are regular, oval, firm and discrete, and on section show typical miliary tubercles. 2. A type described by Delafield and Fogge in which the swellings may be large and hard, appearing in all gland-bearing areas, often discrete and without periadenitis, yet on section entirely caseous. 3. A peculiar adenopathy occurring in negroes, reported by Patten and Bissel, which most resembles the leukemias in course and clinical features, and which eventually proves to be tuberculous. With this condition are associated slow or rapid cachexia, continuous or irregular fever, and increasing anemia. In his discussion of tumors originating from tissue producing lymphocytes, Adami describes a type of gland resembling Hodgkin's disease microscopically, but on intensive staining showing *B. tuberculosis*, the granulomatous hyperplastic lymphadenitis of Ewing. At the Mayo clinic an inquiry was made into the history of patients showing mediastinal involvement of Hodgkin's disease, in order to determine how often tuberculosis was an etiological factor or an associated disease. It was found that apparently tuberculous involvement of the mediastinum is not as common a complication in Hodgkin's disease as in other diseases. *Conclusion:* There are many similarities between tuberculous adenopathy and that of Hodgkin's disease, which are often very confusing to the clinician, and occasionally to the pathologist, but the author believes that infection with the tubercle bacillus does not produce Hodgkin's disease although the two diseases may be associated. A review of the literature with an extensive bibliography accompanies this article.—*Tuberculosis as an Etiological Factor in Hodgkin's Disease: A Historical Review, W. S. Lemon, Amer. J. M. Sci., February, 1924, clxv, 178.*

Echinococcus Cyst of Lung and Liver.—A female, aged 30, presented symptoms of belching, nausea and vomiting after meals, over a period of eight months. Later she developed dull, more or less continuous pain in the right side of the abdomen. A clinical diagnosis of hydrops of the gall bladder was made. Radiological examination of the gastrointestinal tract showed no evidence of any pathological condition. Examination of the gall bladder revealed a mass in the right hyprochondriac region, extending downward below the free border of the right lobe of the liver for about 4 inches, covering the right kidney. It was smooth and sharply circumscribed and had the same density as the liver substance. The same shadow repeated itself on the gastric plates. A diagnosis of cyst of the liver was made. At operation a large cyst, about the size of a grape fruit, originating in the liver and protruding downward, was discovered and removed after evacuating its contents. Two other cysts were found in the liver. At autopsy the lungs showed two cysts in the right lower lobe and one in the left upper lobe.—*Radiological Findings in a Case of Echinococcus Cyst of the Lung and the Liver, J. Glassman, Med. Jour. & Rec., February 6, 1924, cxix, 144.*

Malignant Lymphoma.—Hodgkin's disease is often confused in diagnosis with other conditions, especially tuberculosis, and patients are thus denied the benefits of roentgen-ray therapy. Forty cases of Hodgkin's disease examined radiographically are reported upon; on 7 of these necropsies were done. To successfully interpret the roentgenograms a knowledge of the gross pathology of this disease is necessary. The enlarging lymph nodes form more or less lobulated tumor masses, the lobules being rather smooth and discrete, varying from the size of a pea to that of a hen's egg or larger. They vary considerably in density because fibrosis in them is progressive. Hence, in early cases, the radiographic shadows are less dense than in older cases. In the latter the lobulation may be lost and the appearance of a large tumor mass may be seen in the mediastinum. Matting together of the nodes by fibrosis occurs after secondary infection or roentgen-ray treatment. On account of this fibrosis, the large tumor masses of Hodgkin's disease seldom have the regular outlines of an aneurysm or mediastinal carcinoma. Occasionally in late or acute cases, lymphomatous masses infiltrate the lung tissues, giving somewhat the appearance of the peribronchial thickening and diffuse clouding of the fields seen in bronchopneumonia. Two of the 7 cases that came to necropsy had lymphomatous infiltration of the lungs. Of all the cases studied 7 had pleural effusions. The most common type of intrathoracic involvement, according to radiographic findings, is that with discrete nodes at the roots of the lung. Next in importance is the group in which there are masses extending out from the mediastinum into the lungs. Less frequent forms are the infiltrative type and the type characterized by isolated nodules or metastases in the lung. In the 7 cases which came to necropsy 6 showed mediastinal involvement, 3 hilum nodes, 2 lung infiltration and isolated nodules of lymphomatous tissue in the lungs. Tuberculosis is by far the most important condition to differentiate from Hodgkin's disease. This is extremely important in view of the fact that roentgen-ray treatment, even though it does not cure, prolongs the lives and greatly enhances the comfort of patients with Hodgkin's disease. Apparently Hodgkin's disease starts in the lymph nodes of the mediastinum or hilum, which grow by expansion and produce lobulations or infiltrations, while tuberculosis, in adults at least, usually starts in a focus at the periphery of the lung and infects the lymphatics running to the hilum where massive infection takes place. One of the most useful methods of differentiating Hodgkin's disease from other conditions, especially carcinoma or tuberculosis, is the roentgen-ray therapeutic test. A rapid and marked reduction in the size of the lymphoma is demonstrable by radiograph after one or two treatments, especially if the case is an early one before much fibrosis has taken place in the affected nodes. The differential diagnosis of Hodgkin's disease also includes metastatic sarcoma, carcinoma and enlarged hila, and chronic inflammatory processes. Many reproductions of chest roentgenograms accompany the article.—*Malignant Lymphoma (Hodgkin's Disease), A Radiographic Study, L. R. Whitaker, Arch. Int. Med., October 15, 1923, xxxii, 538.*

Classification of Lymph Node Enlargements.—Previous attempts at classification have, for the most part, been based on single outstanding features; and the very fact that so many classifications have been offered is evidence that no unanimity exists as to the proportionate value to be given each of the criteria, so that we are thrown back upon a pathological basis. Up to about two years ago the progress depended entirely upon clinical and necropsy studies. Since then bacteriological and parasitological data have been accumulating, albeit with small definite results. The adoption of an ac-

ceptable pathological classification permits the preparation of a table of a few definite clinical characters and others with a high degree of probable value. Lymphatic tissue is distributed in the body as ill-outlined lymph-cell collections in organs and in the bone marrow, and as solitary and agminated follicles, lymph nodes and spleen. The first has no special architecture; lymph nodes, unlike the foregoing, are accumulations of lymph cells arranged in an apparently purposeful manner and with an architecture practically identical throughout the body. The spleen is a quite complex lymph node or hemolymph node, being also associated with the vascular system. There are three elements involved in the makeup of a node: lymphoid cells, endothelial cells of the sinuses and perivascular spaces, reticulum cells and fibres. There are also present structures which belong to the so called myeloid series, polynuclear neutrophiles and eosinophiles, and large mononuclears. Some are doubtless deposited by the circulating blood; the existence of primary myeloid centres in the lymph nodes is questionable. The reticulum is an important element in the structure of lymphosarcoma, and appears to be responsible for much of the fibrosis in early Hodgkin's disease, since fine fibrosis is well developed in the follicle when Reed cells are beginning along its edge. The material upon which the present study and classification was based consisted of 65 diagnostic adenectomies on thoroughly studied and tabulated cases, 10 autopsies, and 18 partly tabulated cases in which lymph nodes were submitted for study. A scheme was constructed, based upon changes in each one of the component elements of lymphatic tissue. Hyperplasia, is, of course, the most prominent feature met with; and the malignancy of an excessive growth is directly proportionate to the degree of departure from normal positions and arrangements, likewise the advent of new forms of cells. Degenerative lesions are roughly divisible into those due to the disease virus and those resulting from nutritional disturbance. The term neoinflammatory has been applied to certain cases with inflammatory characteristics, yet with abnormal prominence of certain cells suggesting a disorderly hyperplasia; such is the lymphogranuloma, or Hodgkin's disease, long considered by some tumorous. Simple hyperplasia of lymphoid tissue has so long been called lymphoma that the term is retained. When intraglandular hyperplasia becomes so excessive that mononuclears are spilled into the blood stream, the process becomes leukemia. Cases having a generalized leukemic pathology, yet not showing increased circulating lymphocytes, are termed aleukemic types. All these forms are strictly of lymphocytic origin. In sarcomata, on the other hand, both lymph cells and reticulum are hyperplastic. Adenitis exists when the active nodal elements are joined by adventitious cells of the blood. The term lymphoma is intended to cover the hyperplasias left after certain longstanding irritations and also the condition known as the thymicolymphatic state. The term lymphadenoma is restricted to a tumor made up of lymph nodes. Glandular fever is a peculiar condition, which may be related to acute leukemia and has sometimes been mistaken for it. It is associated with a definite circulating mononucleosis. Leukosarcoma is a local leukemic tumor with increased circulatory mononuclears, while lymphosarcoma is not associated with any change in the blood picture. Endothelioma presents no features of lymphoid tissue.—*A Simple Classification of Lymph Gland Enlargements, Based upon Glands Removed for Diagnosis, H. Fox and D. L. Farley, Amer. J. M. Sc., August, 1923, clxvi, 170.*

Epidemic Erythema Nodosum.—In Gothenburg two epidemics of erythema nodosum were observed. In one family, in which the mother was tuberculous, 4 of 6 children were afflicted with erythema nodosum within a week; in 2 of these there occurred a pleuritis 2½ months later and in 2 a hilum tuberculosis. In the other family the father died of influenza in 1918 and the mother in 1919 of pulmonary tuberculosis. In 1919, 3 of the children were afflicted with erythema nodosum; in 2 a bronchial lymph node tuberculosis was found later and the third developed a cold abscess 7 months later, followed by progressive pulmonary tuberculosis which proved fatal. Another child died of miliary tuberculosis at 4 months. In all the cases there occurred active, massive infections. The uniformity of sporadic and epidemic cases leads to the view of the same etiology. The author, however, disputes the tuberculous nature of erythema nodosum. Circumscribed epidemics speak against the tuberculosis virus as the only etiological agent. The frequency of erythema nodosum in tuberculosis also is no proof, since this is also true of measles and whooping cough. Tuberculosis only furnishes a favorable soil for the virus of erythema nodosum. Erythema nodosum is a specific, acute, contagious, usually slightly infectious, and therefore usually sporadic disease, in rare cases epidemic in character, and preferably attacking children with recent and massive tuberculous infections.—*Epidemisches Auftreten von Erythema nodosum, A. Wallgren, Beitr. z. Klin. d. Tuberk., September, 1922, liii, 143.*

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